FACT SHEET FOR NPDES PERMIT
NO. WA-005217-5

COMMUNITY OF PESHASTIN
PUBLICALLY-OWNED TREATMENT WORKS

DECEMER 14, 2009

PURPOSE OF THIS FACT SHEET

This fact sheet explains and documents the decisions Ecology made in drafting the proposed National Pollutant Discharge Elimination System (NPDES) permit for the Community of Peshastin POTW.

This fact sheet complies with Section 173-220-060 of the Washington Administrative Code (WAC), which requires Ecology to prepare a draft permit and accompanying fact sheet for public evaluation before issuing an NPDES permit.

Ecology makes the draft permit and fact sheet available for public review and comment at least thirty (30) days before issuing the final permit. Copies of the fact sheet and draft permit for the Community of Peshastin Publically-Owned Treatment Works (POTW); NPDES Permit No. WA-005217-5, are available for public review and comment from January 20, 2010 until February 20, 2010. For more details on preparing and filing comments about these documents, please see Appendix A - Public Involvement.

The Community of Peshastin (Peshastin) reviewed the draft permit and fact sheet for factual accuracy. Ecology corrected any errors or omissions regarding the facility's location, history, discharges, or receiving water.

After the public comment period closes, Ecology will summarize substantive comments and provide responses to them. Ecology will include the summary and responses to comments in this Fact Sheet as **Appendix D - Response to Comments**, and publish it when issuing the final NPDES permit. Ecology will not revise the rest of the fact sheet, but the full document will become part of the legal history contained in the facility's permit file.

SUMMARY

The Peshastin POTW discharges to the Wenatchee River. The Wenatchee River watershed is under several categories of total maximum daily load (TMDL) Water Quality Improvement Plans. Ecology prepared one TMDL for temperature and the other for pH and dissolved oxygen. The temperature TMDL established wasteload allocations for discharges to the Wenatchee River. The Peshastin temperature wasteload allocation is established at 33º C. Modeling predicts that no reasonable potential exists, under current conditions, where the effluent would cause an increase

in the receiving water temperature above 0.30 º C. Therefore the proposed permit contains a temperature limit of 33º C as established by the TMDL.

Under the pH and Dissolved Oxygen TMDL Water Quality Improvement Report Peshastin must achieve a 99% reduction in the current and design loads of total phosphorus by 2019, which corresponds to a concentration limit of 90 µg/L at full flow design criteria. The proposed permit requires Peshastin to submit a progress report on its efforts to achieve compliance by the target date.

Ecology changed the allowable fecal coliform colonies per milliliter (ml) to an average monthly limit of 100 colonies per ml and an average weekly limit of 200 colonies per ml. All other limits contained in the proposed permit remain unchanged from the permit issued in December 2004.

TABLE OF CONTENTS

INTRODUCTION

The Federal Clean Water Act (FCWA, 1972, and later amendments in 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One mechanism for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System (NPDES), administered by the federal Environmental Protection Agency (EPA). The EPA authorized the State of Washington to manage the NPDES permit program in our state. Our state legislature accepted the delegation and assigned the power and duty for conducting NPDES permitting and enforcement to Ecology. The legislature defined Ecology's authority and obligations for the wastewater discharge permit program in 90.48 RCW (Revised Code of Washington).

Ecology adopted rules describing how it exercises its authority:

- Procedures Ecology follows for issuing NPDES permits (chapter 173-220 WAC)
- Water quality criteria for surface waters (chapter 173-201A WAC) and for ground waters (chapter 173-200 WAC)
- Sediment management standards (chapter 173-204 WAC)
- Submission of Plans and Reports for Construction of Wastewater Facilities (chapter 173-240 WAC)

These rules require any facility operator to obtain an NPDES permit before discharging wastewater to state waters. They also help define the basis for limits on each discharge and for requirements imposed by the permit.

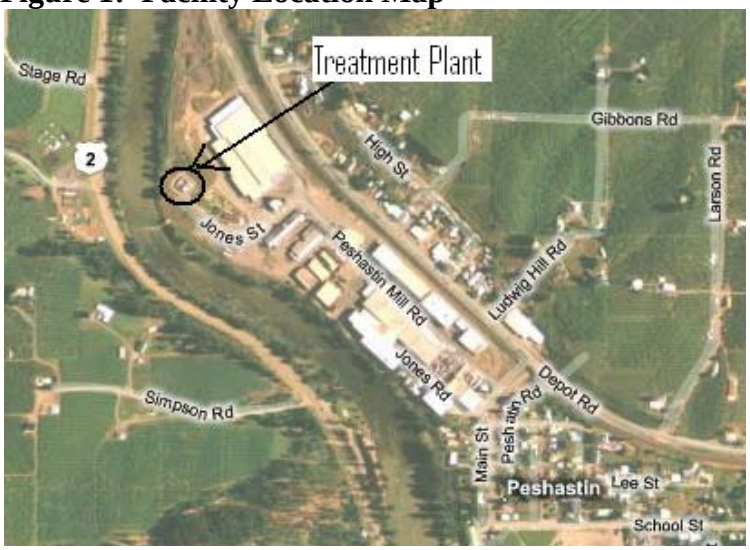
Under the NPDES permit program and in response to a complete and accepted permit application, Ecology must prepare a draft permit and accompanying fact sheet, and make them available for public review before final issuance. Ecology must also publish an announcement (public notice) telling people where they can read the draft permit, and where to send their comments, during a period of thirty days (WAC 173-220-050). (See **Appendix A—*Public Involvement*** for more detail about the public notice and comment procedures). After the public comment period ends, Ecology may make changes to the draft NPDES permit. Ecology will summarize the responses to comments and any changes to the permit in **Appendix D.**

BACKGROUND INFORMATION

TABLE 1: GENERAL FACILITY INFORMATION

GENERAL INFORMATION	
Applicant	Public Utility District No. 1 of Chelan County
Facility Name and Address	Peshastin Publicly-Owned Treatment Works 10395 Mill Road Peshastin, WA 98847
Type of Treatment	Septic tank effluent pump (STEP) system, activated sludge sequencing batch reactor (SBR), aerobic digester, and ultraviolet (UV) disinfection.
Discharge Location	Wenatchee River, River Mile 20.7 Latitude: 47.575 N Longitude: 120.611389 W
Water Body ID Number	1203156474560

Figure 1: Facility Location Map



FACILITY DESCRIPTION

History

In 1990, the residents of the Community of Peshastin (Community) petitioned the Chelan County PUD #1 to determine the feasibility of providing wastewater collection, treatment, and disposal services to the residences and businesses of the area, because of their concern about onsite sewage system failures. The Community is located on the lower east slopes of the Cascades in the upper reaches of the Wenatchee River Valley, on Highway 2, about 100 miles east of Seattle and 17 miles west of Wenatchee.

Construction began on the Community's Publicly Owned Treatment Plant (POTW) in 1996 and the completed system began operating in October 1997.

Ecology approved the 2002 Final Wastewater treatment Facility Capacity Analysis Engineering Report which increased the design capacity.

Collection System Status

The collection system is composed of approximately 3.3 miles of 2-inch through 8-inch pressurized piping which delivers the effluent from various PUD-owned septic tanks to the treatment facility. This type of collection system eliminates the need for pumping stations and deep excavations, and typically has low rates of infiltration and inflow.

Treatment Processes

Wastewater from residences undergoes initial solids removal in a septic tank effluent pumped (STEP) system. Preliminary treatment is onsite, the septic tanks act as small primary clarifiers. As most of the solids remain in the septic tank, the community can use smaller diameter sewer lines and does not need to install grit chambers, bar screens and other unit processes typically associated with headworks at the main treatment plant.

Flows entering the main treatment plant are first pretreated by caustic soda or pre-chlorination injection systems, if necessary. The caustic soda system maintains the effluent pH above 6.0. The treatment plant nitrifies wastewater (oxidize ammonia). During the nitrification process, wastewater alkalinity is consumed. Once all or most of the alkalinity is consumed, wastewater is subject to rapid changes in pH. During operation of the caustic injection system, the operator must closely monitor ammonia levels and effluent pH.

The purpose of the pre-chlorination system is to minimize toxicity and odors caused by hydrogen sulfide in the influent, which is a common occurrence with pressurized collection systems. In the event excessive foaming occurs in the SBRs, an automated system tied to the influent meter

injects chlorine to treat the problem. Influent is next measured by a magnetic flow meter located in the blower room. The flow meter provides information to the caustic soda and pre-chlorination systems and paces the influent auto-sampler.

The treatment plant utilizes a continuous-flow sequencing batch reactor (SBR) system which provides secondary treatment for the Community's wastewater. The primary components of the system include two basins that operate independently, coarse bubble diffusers, aeration blowers and solids pumps. Each SBR utilizes a four-phase process which combines aeration and clarification in the same basin, thereby eliminating the need for separate clarifiers and return activated sludge pumps. Peshastin can convert each SBR to remove ammonia, phosphorus, or nitrogen by altering the aeration and settling sequences. Each basin is equipped with a floating mixer to enable mixing when the aerators are not operating. The system is designed to meet average monthly effluent limits of 30 mg/L for BOD and TSS and 15 mg/L for ammonia. During normal operation the SBR system is completely automated, although the operator must monitor process control parameters to ensure that system processes are working effectively.

The treatment plant includes two sludge digesters which treat, stabilize, and thicken waste solids produced by the SBRs before solids are pumped to the solids dewatering (bagging) system. The digester system is equipped with coarse bubble diffusers and aeration blowers.

After leaving the SBRs, wastewater flows through the effluent flow meter. Effluent flows are continuously recorded. This meter provides flow data to the downstream UV system and the effluent auto-sampler in order to control flow and pace the auto-sampler.

The UV disinfection system contains two banks of low-intensity lamps. One bank of lamps can provide adequate disinfection for the peak decant flow rate discharge from the SBR treatment process.

In accordance with WAC 173-230-140 this facility is classified as a Class II wastewater treatment plant, based on its primary treatment process (activated sludge) and design flow (less than 1 MGD).

The principal treatment plant operator of this system must be, at least, a Class II operator certified by the State of Washington. The facility is currently staffed by a Class II operator.

Industrial Users

The Peshastin POTW accepts wastewater from two significant industrial users (SIUs), Hi-Up and Bluebird. Both industries process fruit for fresh fruit packaging. Hi-Up processes pears only and Bluebird processes cherries and apples. HI-UP does not discharge pear float from its operation to the Peshastin POTW however given the high BOD loads (300-500 mg/L) found in its wastewater Ecology thinks some float chemicals may be leaching out of the wooden boxes

into the discharge. The facility is phasing out these older fruit boxes. Both SIUs use chlorine dioxide in their process and phosphate containing chemicals to treat non-contact cooling water.

A study of influent sources conducted by the Peshastin POTW in 2005 found total phosphorus (T-P) concentrations in the Bluebird discharge averaging at approximately 18 mg/L over the course of the study (July – December 2005) with a high of 66 mg/L. The T-P concentration in Hi-UP's discharge is significantly lower than the domestic sources. The maximum domestic influent T-P concentration was 18 mg/L during the same timeframe. The combined influent T-P concentration peaked at 39.4 mg/L during the study. This occurred at a time when Bluebird discharged 119,000 gallons for the week with a T-P concentration of 42.2 mg/L, Hi-Up at 45,000 gallons at 1.4 mg/L and domestic sources at 7.1 mg/L, no flow figures were given for the domestic contribution. The Peshastin POTW must meet a T-P wasteload allocation in its effluent of approximately 90 µg by 2019. It is presently averaging 8.3 mg/L.

Discharge Outfall

Secondary treated and disinfected effluent is discharged from the facility via an open-ended pipe into the Wenatchee River at River Mile 20.7. The outfall discharges continuously through a 300-foot long, 8-inch diameter effluent pipe located 6 feet from the nearest bank. The outfall, which rests on the bottom, was reported in the "as built drawings" at 3 feet below the water's surface. This value was likely determined when Peshastin installed the outfall but it does not reflect low flow conditions. The 7Q10 low flow depth is 0.78 ft.

Solid Wastes

Any incidental solids (rags, scum, and other debris) removed as part of the routine maintenance of the equipment are drained and disposed of as solid waste at the local landfill.

Biosolids

The Permittee has signed a contract with Boulder Farms to land apply the treated biosolids generated by the treatment plant. The Permittee holds biosolids permit # BA-0052175.

PERMIT STATUS

Ecology issued the previous permit for this facility on December 1, 2004. The previous permit placed effluent limits on BOD, TSS, Fecal coliform bacteria and pH. Peshastin submitted an application for permit renewal on February 12, 2009. Ecology accepted it as complete on February 17, 2009.

SUMMARY OF COMPLIANCE WITH PREVIOUS PERMIT ISSUED

Ecology staff last conducted a non-sampling compliance inspection on October 8, 2009.

The Peshastin POTW has complied with the effluent limits and permit conditions throughout the duration of the permit issued on December 1, 2004**.** Ecology assessed compliance based on its review of the facility's discharge monitoring reports (DMRs) and on inspections conducted by Ecology.

INFLUENT CHARACTERIZATION

Loadings to the POTW were reported in DMRs submitted to Ecology and are compared with the applicable design criteria as follows:

Table 2: Influent Characterization January 2005 through August 2009

Parameter	4-year Characterization		Design Criteria	% Design Criteria
	Average	Highest Monthly Average	Maximum Month	Maximum Month
BOD_5, in lbs/day	93.2	180	240	75.0
TSS, in lbs/day	48.6	152	240	63.3

WASTEWATER CHARACTERIZATION

The concentration of pollutants in the discharge was reported in the NPDES application and in discharge monitoring reports. The tabulated data represents the quality of the effluent discharged from the Peshastin POTW. The effluent is characterized as follows:

Table 3: Effluent Characterization January 2005 through August 2009

Parameter	Units	Maximum Monthly Value	Monthly Average Value
Flow	MGD	0.062 (Max Day 0.092)	0.047
5-day Biochemical Oxygen Demand (BOD_5)	mg/L	10.9	3.1
Total Suspended Solids (TSS)	mg/L	13.7	3.1
Fecal Coliform Bacteria	#/100 mL	54	4.5
Temperature (Summer)	ºC	24.0 (25 Max Day)	21.3
Ammonia (as N)	mg/L	11.9	0.8
Dissolved Oxygen (DO)	mg/L	7.1	2.7
		Maximum Value	**Minimum Value**
pH	S. U.'s	9.0	6.7
Total Phosphorus	mg/L	32.2	0.3
Hardness	mg/L	354.0	170.5

DESCRIPTION OF THE RECEIVING WATER

The Peshastin POTW discharges to the Wenatchee River. Other nearby point source outfalls include the City of Leavenworth, located approximately four miles upstream. The Community of Dryden located approximately five miles downstream discharges to ground, which discharge Ecology believes is in continuity with the river. Significant other nearby non-point sources of pollutants include domestic drainfields, agricultural runoff, and stormwater runoff from highway U.S. 2.

Table 4 contains data which reflect effluent characteristics from 2000-2003 during the low flow months of September and October. Ecology used this data to determine the reasonable potential to violate water quality standards. The receiving water data were taken from section 4.3 of the 1994 ER.

Table 4: EAP and USGS Ambient Background Data

Parameter	Receiving Water
7Q10 Flow, cfs [1]	317
Velocity, fps [2]	2.27
Water depth, feet [2]	0.78
Width of Receiving Water, feet [2]	217
Hardness, mg/L as $CaCO_3$ [2]	14
Alkalinity, mg/L as $CaCO_3$ [3]	28.0
Temperature (max.), °C [3]	20.3
pH [3]	8.6 max 6.5 min
DO, mg/L [3]	14.2 max 8.5 min
Fecal Coliform, #/100ml [3]	24
Total Ammonia, mg/L [3]	0.01

[1] United States Geological Survey gauging station near Peshastin 1981 through 2009
[2] Data were taken from section 4.3 of the 1994 ER.
[3] Ecology's Environmental Assessment Program data from 2001 through 2008

SEPA COMPLIANCE

Regulation exempts reissuance or modification of any wastewater discharge permit from the SEPA process as long as the permit contains conditions are no less stringent than state rules and regulations. The exemption applies only to existing discharges, not to new discharges.

PROPOSED PERMIT LIMITS

Federal and state regulations require that effluent limits in an NPDES permit must be either technology- or water quality-based.

- Technology-based limits are based upon the treatment methods available to treat specific pollutants. Technology-based limits are set by the EPA and published as a regulation, or Ecology develops the limit on a case-by-case basis (40 CFR 125.3, and chapter 173-220 WAC).

- Water quality-based limits are calculated so that the effluent will comply with the Surface Water Quality Standards (chapter 173-201A WAC), Ground Water Standards (chapter 173-200 WAC), Sediment Quality Standards (chapter 173-204 WAC) or the National Toxics Rule (40 CFR 131.36).

- Ecology must apply the most stringent of these limits to each parameter of concern. These limits are described below.

The limits in this permit reflect information received in the application and from supporting reports (engineering, hydrogeology, etc.). Ecology evaluated the permit application and determined the limits needed to comply with the rules adopted by the state of Washington. Ecology does not develop effluent limits for all reported pollutants**.** Some pollutants are not treatable at the concentrations reported, are not controllable at the source, are not listed in regulation, and do not have a reasonable potential to cause a water quality violation.

Nor does Ecology usually develop limits for pollutants that were not reported in the permit application but that may be present in the discharge. The permit does not authorize discharge of the non-reported pollutants. If significant changes occur in any constituent of the effluent discharge, The Peshastin POTW is required to notify Ecology (40 CFR 122.42(a)). The Peshastin POTW may be in violation of the permit until Ecology modifies the permit to reflect additional discharge of pollutants.

DESIGN CRITERIA

In December of 2002 the Department approved the Peshastin Wastewater Facility Capacity Analysis Engineering Report. The design criteria for the POTW are as follows in Table 5:

Table 5: Design Standards for the Peshastin WWTP

Parameter	Design Criteria
Maximum monthly flow (MGD)	0.11
Maximum daily flow (MGD)	0.20
Peak hydraulic flow (MGD)	0.27
Average annual flow (MGD)	0.09
BOD influent loading (lbs/day)	240
TSS influent loading (lbs/day)	240
Design population equivalent (# of people)	1,100

TECHNOLOGY-BASED EFFLUENT LIMITS

Federal and state regulations define technology-based effluent limits for municipal wastewater treatment plants. These effluent limits are given in 40 CFR Part 133 (federal) and in chapter 173-221 WAC (state). These regulations are performance standards that constitute all known,

available, and reasonable methods of prevention, control, and treatment (AKART) for municipal wastewater.

Chapter 173-221 WAC lists the following technology-based limits for pH, fecal coliform, BOD_5, and TSS:

Table 6: Technology-based Limits

Parameter	Limit
pH	The pH must measure within the range of 6 to 9 standard units.
Fecal Coliform Bacteria	Monthly Geometric Mean = 200 organisms/100 mL Weekly Geometric Mean = 400 organisms/100 mL
BOD_5 (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 45 mg/L
TSS (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 45 mg/L

The technology-based mass limits are based on WAC 173-220-130(3)(b) and 173-221-030(11)(b).

Monthly BOD_5 effluent mass loading (lbs/day)
Maximum monthly design flow (0.11 MGD) x 30 mg/L X 8.34 = 27.5 lbs/day.

Monthly TSS effluent mass loading (lbs/day)
Maximum monthly design flow (0.11 MGD) x 30 mg/L X 8.34 = 27.5 lbs/day.

Weekly BOD_5 effluent mass loading (lbs/day)
1.5 x Monthly BOD_5 effluent mass loading = 41.3 lbs/day.

Weekly TSS effluent mass loading (lbs/day)
1.5 x Monthly TSS effluent mass loading = 41.3 lbs/day.

SURFACE WATER QUALITY-BASED EFFLUENT LIMITS

The Washington State Surface Water Quality Standards (chapter 173-201A WAC) are designed to protect existing water quality and preserve the designated uses of Washington's surface

waters. Waste discharge permits must include conditions that ensure the discharge will meet the surface water quality standards (WAC 173-201A-510). Water quality-based effluent limits may be based on an individual waste load allocation or on a waste load allocation developed during a basin wide total maximum daily load study (TMDL).

Numerical Criteria for the Protection of Aquatic Life and Recreation

Numerical water quality criteria are listed in the water quality standards for surface waters (chapter 173-201A WAC). They specify the maximum levels of pollutants allowed in receiving water to protect aquatic life and recreation in and on the water. Ecology uses numerical criteria along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limits, the discharge must meet the water quality-based limits.

Numerical Criteria for the Protection of Human Health

The U.S. EPA has published 91 numeric water quality criteria for the protection of human health that are applicable to dischargers in Washington State (EPA 1992). These criteria are designed to protect humans from exposure to pollutants linked to cancer and other disease, based on consuming fish and shellfish and drinking contaminated surface waters. The water quality standards also include radionuclide criteria to protect humans from the effects of radioactive substances.

Narrative Criteria

Narrative water quality criteria (e.g., WAC 173-201A-240(1); 2006) limit the toxic, radioactive, or other deleterious material concentrations that the facility may discharge to levels below those which have the potential to:

- Adversely affect designated water uses.
- Cause acute or chronic toxicity to biota.
- Impair aesthetic values.
- Adversely affect human health.

Narrative criteria protect the specific designated uses of all fresh waters (WAC 173-201A-200, 2006) and of all marine waters (WAC 173-201A-210,; 2006) in the State of Washington.

Antidegradation

The purpose of Washington's Antidegradation Policy (WAC 173-201A-300-330, 2006) is to:

- Restore and maintain the highest possible quality of the surface waters of Washington.
- Describe situations under which water quality may be lowered from its current condition.
- Apply to human activities that are likely to have an impact on the water quality of surface water.
- Ensure that all human activities likely to contribute to a lowering of water quality, at a minimum, apply all known, available, and reasonable methods of prevention, control, and treatment (AKART).
- Apply three tiers of protection (described below) for surface waters of the state.

Tier I ensures existing and designated uses are maintained and protected and applies to all waters and all sources of pollutions. Tier II ensures that waters of a higher quality than the criteria assigned are not degraded unless such lowering of water quality is necessary and in the overriding public interest. Tier II applies only to a specific list of polluting activities. Tier III prevents the degradation of waters formally listed as "outstanding resource waters," and applies to all sources of pollution.

A facility must prepare a Tier II analysis when all three of the following conditions are met:

- The facility is planning a new or expanded action.
- Ecology regulates or authorizes the action.
- The action has the potential to cause measurable degradation to existing water quality at the edge of a chronic mixing zone.

This facility must meet Tier I requirements.

- Dischargers must maintain and protect existing and designated uses. Ecology must not allow any degradation that will interfere with, or become injurious to, existing or designated uses, except as provided for in chapter 173-201A WAC.

Ecology's analysis described in this section of the fact sheet demonstrates that the existing and designated uses of the receiving water will be protected under the conditions of the proposed permit.

Mixing Zones

A mixing zone is the defined area in the receiving water surrounding the discharge port(s), where wastewater mixes with receiving water. Within mixing zones the pollutant concentrations may exceed water quality numeric standards, so long as the discharge doesn't interfere with designated uses of the receiving water body (for example, recreation, water supply, and aquatic

life and wildlife habitat, etc.) The pollutant concentrations outside of the mixing zones must meet water quality numeric standards.

State and federal rules allow mixing zones because the concentrations and effects of most pollutants diminish rapidly after discharge, due to dilution. Ecology defines mixing zone sizes to limit the amount of time any exposure to the end-of-pipe discharge could harm water quality, plants, or fish.

The state's water quality standards allow Ecology to authorize mixing zones for the facility's permitted wastewater discharges only if those discharges already receive all known, available, and reasonable methods of prevention, control, and treatment (AKART). Mixing zones typically require compliance with water quality criteria within a specified distance from the point of discharge and use no more than 25% of the available width of the water body for dilution. Ecology uses modeling to estimate the amount of mixing within the mixing zone. Through modeling Ecology determines the potential for violating the water quality standards at the edge of the mixing zone and derive any necessary effluent limits. Steady-state models are the most frequently used tools for conducting mixing zone analyses. Ecology chooses values for each effluent and for receiving water variables that correspond to the time period when the most critical condition is likely to occur (see Ecology's *Permit Writer's Manual*). Each critical condition parameter, by itself, has a low probability of occurrence and the resulting dilution factor is conservative. The term "reasonable worst - case" applies to these values.

The mixing zone analysis produces a numerical value called a dilution factor (DF). A dilution factor represents the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. For example, a dilution factor of 10 means the effluent is 10% and the receiving water is 90% of the total volume of water at the boundary of the mixing zone. Ecology uses dilution factors with the water quality criteria to calculate reasonable potentials and effluent limits. Water quality standards include both aquatic life-based criteria and human health-based criteria. The former are applied at both the acute and chronic mixing zone boundaries; the latter are applied only at the chronic boundary. The concentration of pollutants at the boundaries of any of these mixing zones may not exceed the numerical criteria for that zone.

Each aquatic life **acute** criterion is based on the assumption that organisms are not exposed to that concentration for more than one hour and more often than one exposure in three years. Each aquatic life **chronic** criterion is based on the assumption that organisms are not exposed to that concentration for more than four consecutive days and more often than once in three years.

The two types of human health-based water quality criteria distinguish between those pollutants linked to non-cancer effects (non-carcinogenic) and those linked to cancer effects (carcinogenic). The human health-based water quality criteria incorporate several exposure and risk assumptions. These assumptions include:

- A 70-year lifetime of daily exposures.
- An ingestion rate for fish or shellfish measured in kg/day.
- An ingestion rate of two liters/day for drinking water
- A one-in-one-million cancer risk for carcinogenic chemicals.

This permit authorizes a small acute mixing zone, surrounded by a chronic mixing zone around the point of discharge (WAC 173-201A-400). The water quality standards impose certain conditions before allowing the discharger a mixing zone:

1. Ecology must specify both the allowed size and location in a permit.

The proposed permit specifies the size and location of the allowed mixing zone.

For this discharge, the percent volume restrictions of the water quality standards resulted in a lower dilution factor than the distance and width restrictions. Therefore, the dilution factor calculated at a 10-year low flow was used to determine reasonable potential to exceed water quality standards.

2. The facility must fully apply "all known, available, and reasonable methods of prevention, control and treatment" (AKART) to its discharge.

Ecology has determined that the treatment provided at the Peshastin POTW meets the requirements of AKART (see "Technology based Limits").

3. Ecology must consider critical discharge conditions.

Surface water quality-based limits are derived for the waterbody's critical condition (the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or designated waterbody uses). The critical discharge condition is often pollutant-specific or waterbody-specific.

Critical discharge conditions are those conditions that result in reduced dilution or increased effect of the pollutant. Factors affecting dilution include the depth of water, the density stratification in the water column, the currents, and the rate of discharge. Density stratification is determined by the salinity and temperature of the receiving water. Temperatures are warmer in the surface waters in summer. Therefore, density stratification is generally greatest during the summer months. Density stratification affects how far up in the water column a freshwater plume may rise. The rate of mixing is greatest when an effluent is rising. The effluent stops rising when the mixed effluent is the same density as the surrounding water. After the effluent stops rising, the rate of mixing is much more gradual. Water depth can affect dilution when a plume might rise to the surface when there is little or no stratification. Ecology's *Permit Writer's Manual* describes additional

guidance on criteria/design conditions for determining dilution factors. The manual can be obtained from Ecology's website at: http://www.ecy.wa.gov/biblio/92109.html.

The Outfall 001 has a diameter of 8 inches and is 6 feet from the nearest bank. The diffuser has a single 8-inch diameter port. The diffuser depth at 7Q10 low flow is 0.78 feet.

Ecology used the following critical conditions to model the discharge:

- The seven-day-average low river flow with a recurrence interval of ten years (7Q10) 317 cfs.
- River depth of 0.78 feet at the 7Q10 period.
- River velocity of 2.2 feet per second.
- Manning roughness coefficient 0.035.
- 25% of channel width of 216 feet for chronic and 2.5% for the acute mixing zone.
- Maximum average monthly effluent flow of .062 MGD for chronic and human health non-carcinogen.
- Maximum daily flow of .092 MGD for acute mixing zone.
- Maximum effluent temperature of 25 degrees C.

4. Supporting information must clearly indicate the mixing zone would not:

- Have a reasonable potential to cause the loss of sensitive or important habitat.
- Substantially interfere with the existing or characteristic uses.
- Result in damage to the ecosystem.
- Adversely affect public health.

Ecology established Washington State water quality criteria for toxic chemicals using EPA criteria. EPA developed the criteria using toxicity tests with numerous organisms and set the criteria to generally protect the species tested and to fully protect all commercially and recreationally important species.

EPA sets acute criteria for toxic chemicals assuming organisms are exposed to the pollutant at the criterion concentration for one hour. They set chronic standards assuming organisms are exposed to the pollutant at the criterion concentration for four days. Dilution modeling under critical conditions generally shows that both acute and chronic criteria concentrations are reached within minutes of being discharged.

The discharge plume does not impact drifting and non-strong swimming organisms because they cannot stay in the plume close to the outfall long enough to be affected. Strong swimming fish could maintain a position within the plume, but they can also avoid the discharge by swimming away. Mixing zones generally do not affect benthic organisms (bottom dwellers) because the buoyant plume rises in the water column. Ecology has additionally determined that the effluent will not exceed 33 degrees C for more than two

seconds after discharge; and that the temperature of the water will not create lethal conditions or blockages to fish migration.

Ecology evaluates the cumulative toxicity of an effluent by testing the discharge with whole effluent toxicity (WET) testing.

Ecology reviewed the above information, the specific information on the characteristics of the discharge, the receiving water characteristics and the discharge location. Based on this review, Ecology concluded that the discharge does not have a reasonable potential to cause the loss of sensitive or important habitat, substantially interfere with existing or characteristics uses, result in damage to the ecosystem, or adversely affect public health.

5. The discharge/receiving water mixture must not exceed water quality criteria outside the boundary of a mixing zone.

Ecology conducted a reasonable potential analysis, using procedures established by the EPA and by Ecology, for each pollutant and concluded the discharge/receiving water mixture will not violate water quality criteria outside the boundary of the mixing zone if permit limits are met.

6. The size of the mixing zone and the concentrations of the pollutants must be minimized.

At any given time, the effluent plume uses only a portion of the acute and chronic mixing zone, which minimizes the volume of water involved in mixing. The plume rises through the water column as it mixes, therefore much of the receiving water volume at lower depths in the mixing zone is not mixed with discharge. Similarly, because the discharge may stop rising at some depth due to density stratification, waters above that depth will not mix with the discharge. Ecology determined it is impractical to specify in the permit the actual, much more limited volume in which the dilution occurs as the plume rises and moves with the current.

Ecology minimizes the size of mixing zones by requiring dischargers to install diffusers when they are appropriate to the discharge and the specific receiving waterbody. When a diffuser is installed, the discharge is more completely mixed with the receiving water in a shorter time. Ecology also minimizes the size of the mixing zone (in the form of the dilution factor) using design criteria with a low probability of occurrence. For example, Ecology uses the expected 95^{th} percentile pollutant concentration, the 90^{th} percentile background concentration, the centerline dilution factor, and the lowest flow occurring once in every ten years to perform the reasonable potential analysis.

Because of the above reasons, Ecology has effectively minimized the size of the mixing zone authorized in the proposed permit.

7. Maximum size of mixing zone.

The authorized mixing zone does not exceed the maximum size restriction.

8. Acute Mixing Zone.

- **The discharge/receiving water mixture must comply with acute criteria as near to the point of discharge as practicably attainable.**
  Ecology determined the acute criteria will be met at 10% of the distance at the ten year low flow.
- **The pollutant concentration, duration, and frequency of exposure to the discharge will not create a barrier to migration or translocation of indigenous organisms to a degree that has the potential to cause damage to the ecosystem.**
  As described above, the toxicity of any pollutant depends upon the exposure, the pollutant concentration, and the time the organism is exposed to that concentration. Authorizing a limited acute mixing zone for this discharge assures that it will not create a barrier to migration. The effluent from this discharge will rise as it enters the receiving water, assuring that the rising effluent will not cause translocation of indigenous organisms near the point of discharge (below the rising effluent).

- **Comply with size restrictions.**
  The mixing zone authorized for this discharge complies with the size restrictions published in chapter 173-201A WAC.

9. Overlap of Mixing Zones.

This mixing zone does not overlap another mixing zone.

DESIGNATED USES AND SURFACE WATER QUALITY CRITERIA

Applicable designated uses and surface water quality criteria are defined in chapter 173-201A WAC. In addition, the U.S. EPA set human health criteria for toxic pollutants (EPA 1992). Criteria applicable to this facility's discharge are summarized below in Table 5.

- Aquatic Life Uses are designated based on the presence of, or the intent to provide protection for, the key uses. All indigenous fish and non-fish aquatic species must be protected in waters of the state in addition to the key species. The Aquatic Life Uses for this receiving water are identified below.

Table 7: Aquatic Life Uses & Associated Criteria

Core Summer Habitat	
Temperature Criteria – Highest 7DAD MAX	16º C (60.8° F)
Dissolved Oxygen Criteria – Lowest 1-Day Minimum	9.5.0 mg/L
Turbidity Criteria	• 5 NTU over background when the background is 50 NTU or less; or • A 10 percent increase in turbidity when the background turbidity is more than 50 NTU
Total Dissolved Gas Criteria	Total dissolved gas shall not exceed 110 percent of saturation at any point of sample collection
pH Criteria	pH shall be within the range of 6.5 to 8.5 with a human-caused variation within the above range of less than 0.5 units

Table 8: Recreational Uses and Associated Criteria

Recreational Use	**Criteria**
Primary Contact Recreation	Fecal coliform organism levels must not exceed a geometric mean value of 100 colonies /100 mL, with not more than 10 percent of all samples (or any single sample when less than ten sample points exist) obtained for calculating the geometric mean value exceeding 200 colonies /100 mL

- The **water supply uses** are domestic, agricultural, industrial, and stock watering.
- The **miscellaneous freshwater use**s are wildlife habitat, harvesting, commerce and navigation, boating, and aesthetics.

EVALUATION OF SURFACE WATER QUALITY-BASED EFFLUENT LIMITS FOR NUMERIC CRITERIA

Pollutants in an effluent may affect the aquatic environment near the point of discharge (near-field) or at a considerable distance from the point of discharge (far-field). Toxic pollutants, for example, are near-field pollutants—their adverse effects diminish rapidly with mixing in the receiving water. Conversely, a pollutant such as biological oxygen demand (BOD) is a far-field pollutant whose adverse effect occurs away from the discharge even after dilution has occurred. Thus, the method of calculating surface water quality-based effluent limits varies with the point at which the pollutant has its maximum effect.

With technology-based controls (AKART), predicted pollutant concentrations in the discharge exceed water quality criteria. Ecology therefore authorizes a mixing zone in accordance with the

geometric configuration, flow restriction, and other restrictions imposed on mixing zones by chapter 173-201A WAC.

Dilution Factor Recalculation

Ecology recalculated the dilution factors contained in the proposed permit using the RIVPLUM V mixing model. Ecology believes the use of the CORMIX model derived a larger dilution factor because the model is more appropriate for slower flowing and deeper river, whereas the Wenatchee at the Peshastin location is shallow. RIVPLUM V on the other hand works well in shallow fast moving waters where vertical mixing is almost instantaneous. The recalculation reduced the chronic dilution factor by 12%.

Chronic Mixing Zone

WAC 173-201A-400(7)(a) specifies that mixing zones must not extend in a downstream direction from the discharge ports for a distance greater than 300 feet plus the depth of water over the discharge ports or extend upstream for a distance of over 100 feet, not utilize greater than **25%** of the flow, and not occupy greater than **25%** of the width of the water body.

The chronic mixing zone is extends 300 feet in the downstream direction and 100 feet in the upstream direction. The mixing zone is 18.5 feet wide. The mixing zone extends from the river bottom to the water surface.

Acute Mixing Zone

WAC 173-201A-400(8)(a) specifies that in rivers and streams a zone where acute toxics criteria may be exceeded must not extend beyond 10% of the distance towards the upstream and downstream boundaries of the chronic zone, not use greater than **2.5%** of the flow and not occupy greater than **25%** of the width of the water body.

The acute mixing zone extends 30 feet in the downstream direction and 10 feet in the upstream direction. The width of the mixing zone is 7.9 feet. The mixing zone extends from the river bottom to the water surface.

Ecology determined the dilution factors that occur within these zones at the critical condition using RIVPLUM V. The dilution factors are listed in Table 9:

Table 9: Dilution Factors (DF)

Criteria	Acute	Chronic
Aquatic Life	59	242

Ecology determined the impacts of BOD_5, pH, ammonia, and temperature as described below, using the dilution factors in the above table. The derivation of surface water quality-based limits also takes into account the variability of pollutant concentrations in both the effluent and the receiving water.

BOD_5--With technology-based limits, this discharge results in a small amount of BOD loading relative to the large amount of dilution in the receiving water at critical conditions. Technology-based limits will ensure that dissolved oxygen criteria are met in the receiving water.

Temperature--The state temperature standards (WAC 173-201A-200-210 and 600-612) include multiple elements:

- Annual summer maximum threshold criteria (June 15 to September 15)
- Supplemental spawning and rearing season criteria (September 15 to June 15)
- Incremental warming restrictions
- Protections against acute effects

Ecology evaluates each criterion independently to determine reasonable potential and derive permit limits.

- Annual summer maximum and supplementary spawning/rearing criteria
  Each water body has an annual maximum temperature criterion [WAC 173-201A-200(1)(c), 210(1)(c), and Table 602]. These threshold criteria (e.g., 12, 16, 17.5, 20°C) protect specific categories of aquatic life by controlling the effect of human actions on summer temperatures.

  Some waters have an additional threshold criterion to protect the spawning and incubation of salmonids (9°C for char and 13°C for salmon and trout) [WAC 173-201A-602, Table 602]. These criteria apply during specific date-windows.

  The threshold criteria apply at the edge of the chronic mixing zone. Criteria for most fresh waters are expressed as the highest 7-Day average of daily maximum temperature (7-DADMax). The 7-DADMax temperature is the arithmetic average of seven consecutive measures of daily maximum temperatures. Criteria for marine waters and some fresh waters are expressed as the highest 1-Day annual maximum temperature (1-DMax).

- Incremental warming criteria

The water quality standards limit the amount of warming human sources can cause under specific situations [WAC 173-201A-200(1)(c)(i)-(ii), 210(1)(c)(i)-(ii)]. The incremental warming criteria apply at the edge of the chronic mixing zone.

At locations and times when background temperatures are cooler than the assigned threshold criterion, point sources are permitted to warm the water by only a defined increment. These increments are permitted only to the extent doing so does not cause temperatures to exceed either the annual maximum or supplemental spawning criteria.

At locations and times when a threshold criterion is being exceeded due to natural conditions, all human sources, considered cumulatively, must not warm the water more than 0.3°C above the naturally warm condition.

When Ecology has not yet completed a TMDL, our policy allows each point source to warm water at the edge of the chronic mixing zone by 0.3°C. This is true regardless of the background temperature and even if doing so would cause the temperature at the edge of a standard mixing zone to exceed the numeric threshold criteria. Allowing a 0.3°C warming for each point source is reasonable and protective where the dilution factor is based on 25% or less of the critical flow. This is because the fully mixed effect on temperature will only be a fraction of the 0.3°C cumulative allowance (0.075°C or less) for all human sources combined.

- Temperature Acute Effects

Instantaneous lethality to passing fish: The upper 99th percentile daily maximum effluent temperature must not exceed 33°C; unless a dilution analysis indicates ambient temperatures will not exceed 33°C 2-seconds after discharge.

General lethality and migration blockage: Measurable (0.3°C) increases in temperature at the edge of a chronic mixing zone are not allowed when the receiving water temperature exceeds either a 1DMax of 23°C or a 7DADMax of 22°C.

Lethality to incubating fish: Human actions must not cause a measurable (0.3°C) warming above 17.5°C at locations where eggs are incubating.

TEMPERATURE TMDL

Summer water temperatures of the Wenatchee River and some of its tributaries (Chiwaukum Creek, Icicle Creek, Little Wenatchee River, Nason Creek, Mission Creek, and Peshastin Creek) are warmer than Washington State (the state) water quality standards that are set to protect fish.

As a result, these waters were included on the state's list of water-quality-impaired waters called the 303(d) list. A total maximum daily load (TMDL) has been approved.

The goal of the TMDL is to ensure that water bodies in the Wenatchee River watershed on the 2004 303(d) list for temperature will reach water quality standards within a reasonable period of time. This TMDL is implemented in coordination with the Wenatchee Watershed Management Plan (WWMP).

Ecology has coordinated and will continue to coordinate the development and implementation of the Wenatchee River Watershed Temperature TMDL with the WWMP and its participating entities. Ecology started development of the WWMP in 1999, and the Wenatchee Watershed Planning Unit (WWPU) unanimously approved it on April 26, 2006. You can download the plan from the following website:

http://www.co.chelan.wa.us/nr/nr_watershed_plan.htm

Ecology evaluated wasteload allocations for the National Pollution Discharge Elimination System (NPDES)discharges for the Wenatchee River basin. Maximum temperatures for NPDES effluent discharges (TNPDES) were calculated using the following equation for system potential upstream temperatures greater than or equal to 16ºC (all point sources in this TMDL study discharge to waters that are designated as Class AA) or 18ºC (all point sources discharge to waters that are designated as Class A).

Class AA: TNPDES = [16ºC- 0.3 ºC] + [chronic dilution factor] * 0.3ºC
Class A: TNPDES = [18ºC – 0.3 ºC] + [chronic dilution factor] * 0.3ºC

Maximum effluent temperatures should also be no greater than 33ºC to avoid creating areas in the mixing zone that would cause instantaneous lethality.

Table 10 contains the point source WLAs for point source dischargers in WIRA 45.

Table 10: Wasteload Allocation (WLA)

NPDES Facility	Chronic Dilution Factor	Water Quality Standard for Temperature in Degrees C	Maximum Allowable Effluent Temperature Wasteload Allocation in Degrees C
Lake Wenatchee POTW	**214**	**16**	**33.0**
Stevens Pass POTW	**1**	**16**	**16.0**
Leavenworth POTW	**37.1**	**16**	**28.8**
Cashmere POTW	**100**	**16**	**33.0**
Peshastin POTW	**331.7**	**16**	**33.0**
Leavenworth National Fish Hatchery	**1**	**16**	**18.0**

Annual summer maximum, and incremental warming criteria: Ecology calculated the reasonable potential for the discharge to exceed the annual summer maximum, and the incremental warming criteria at the edge of the chronic mixing zone during critical condition. No reasonable potential exists to exceed the temperature criterion where:

(Criterion + 0.3) > (Criterion + ($T_{effluent95}$ – Criterion))/DF.
(17.5 + 0.3) > (17.5 + (23.95_{95th} max day eff. temp – 17.5))/242) = 0.1 increase.
17.8>17.6

Therefore, the proposed permit includes a temperature limit based on the WLA allotment or the warming criteria.

pH--Ecology modeled the impact of the effluent pH on the receiving water using the calculations from EPA, 1988, and the chronic dilution factor of 280 :1. The receiving water input variables used are listed above in Table 4 (page 10). The effluent input variables used are included in Table 2.

Ecology predicts no violation of the pH criteria under critical conditions. Therefore, the proposed permit includes technology-based effluent limits for pH.

Fecal Coliform—The proposed permit includes a water quality-based limit for primary recreational contact of 100 colonies per milliliter for the monthly average and 200 colonies for the weekly average rather than the technology based limits in the existing permit. Peshastin has shown it can easily meet the water quality based limit during the permit term.

Toxic Pollutants--Federal regulations (40 CFR 122.44) require Ecology to place limits in NPDES permits on toxic chemicals in an effluent whenever there is a reasonable potential for those chemicals to exceed the surface water quality criteria. Ecology does not exempt facilities with technology-based effluent limits from meeting the surface water quality standards.

The following toxic pollutant is present in the discharge: ammonia. Ecology conducted a reasonable potential analysis (See **Appendix** C) on ammonia to determine whether it would require effluent limits in this permit.

Ammonia's toxicity depends on that portion which is available in the unionized form. The amount of unionized ammonia depends on the temperature and pH in the receiving freshwater. To evaluate ammonia toxicity, Ecology used the available receiving water information for ambient station, 45A-110 Wenatchee River-Near Leavenworth, and Ecology spreadsheet tools.

No reasonable potential to violate the water quality criteria for ammonia was found. There, the proposed permit does not contain a limit for ammonia.

DISSOLVED OXYGEN AND pH TMDL CONSIDERATIONS

The Wenatchee River watershed is under 4 TMDLs which addresses dissolved oxygen deficiencies and high pH in the Wenatchee River watershed. The Wenatchee River Watershed Dissolved Oxygen and pH Total Maximum Daily Load Report, Revised August 2009 Publication No. 08-10-062 requires point source discharger to achieve a target reduction in phosphorus loading to the river by 2019. The TMDL calls for a substantial reduction in phosphorus loads from the current loads. The proposed permit includes a compliance schedule requiring Peshastin to meet the wasteload allocations included in the TMDL. The waste load expressed as a concentration is 90 µg/L at full flow design criteria or a maximum load of 0.037 kg/Day total phosphorous.

Whole Effluent Toxicity

The water quality standards for surface waters forbid discharge of effluent that causes toxic effects in the receiving waters. Many toxic pollutants cannot be measured by commonly available detection methods. However, laboratory tests can measure toxicity directly by exposing living organisms to the wastewater and measuring their responses. These tests measure the aggregate toxicity of the whole effluent, so this approach is called whole effluent toxicity (WET) testing. Some WET tests measure acute toxicity and other WET tests measure chronic toxicity.

Using the screening criteria in chapter 173-205-040 WAC, Ecology determined that toxic effects caused by unidentified pollutants in the effluent are unlikely. Therefore, this permit does not require WET testing. Ecology may require WET testing in the future if it receives information indicating that toxicity may be present in this effluent.

Human Health

Washington’s water quality standards include 91 numeric human health-based criteria that Ecology must consider when writing NPDES permits. These criteria were established in 1992 by the U.S. EPA in its National Toxics Rule (40 CFR 131.36). The National Toxics Rule allows states to use mixing zones to evaluate whether discharges comply with human health criteria.

Ecology determined the applicant's discharge is unlikely to contain chemicals regulated to protect human health.

Sediment Quality

The aquatic sediment standards (chapter 173-204 WAC) protect aquatic biota and human health. Under these standards Ecology may require a facility to evaluate the potential for its discharge to cause a violation of sediment standards (WAC 173-204-400). You can obtain additional information about sediments at the Aquatic Lands Cleanup Unit website. http://www.ecy.wa.gov/programs/tcp/smu/sediment.html

Through a review of the discharger characteristics and of the effluent characteristics, Ecology determined that this discharge has no reasonable potential to violate the sediment management standards.

Ground Water Quality Limits

The ground water quality standards (chapter 173-200 WAC) protect beneficial uses of ground water. Permits issued by Ecology must not allow violations of those standards (WAC 173-200-100).

The Peshastin POTW does not discharge wastewater to the ground. No permit limits are required to protect ground water.

COMPARISON OF THE PROPOSED EFFLUENT LIMITS WITH THE PREVIOUS PERMIT ISSUED ON DECEMBER 1, 2004

The permit limits are unchanged except for pH and fecal coliform bacteria. Ecology changed the fecal coliform limits from a monthly average of 400 colonies per ml to 200 colonies per ml and a weekly average of 200 colonies per ml to 100 colonies per ml.

Table 11: Comparison of Effluent Limits

Parameter	Permit Issued December 1, 2004		Proposed Permit	
	Average Monthly	Average Weekly	Average Monthly	Average Weekly
BOD_5	30 mg/L; 27.5lbs/day	45 mg/L; 41.25 lbs/day	30 mg/L; 27.5lbs/day	45 mg/L; 41.25 lbs/day
Total Suspended Solids	30 mg/L; 27.5 lbs/day	45 mg/L; 41.25 lbs/day	30 mg/L; 27.5 lbs/day	45 mg/L; 41.25 lbs/day
Fecal Coliform Bacteria	200	400	100	200
pH, Standard Units	shall not be outside the range of 6.0 to 9.0		shall not be outside the range of 6 to 9	

MONITORING REQUIREMENTS

Ecology requires monitoring, recording, and reporting (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and that the discharge complies with the permit's effluent limits.

The monitoring schedule is detailed in the proposed permit under Condition S2. Specified monitoring frequencies take into account the quantity and variability of the discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring. The required monitoring frequency is consistent with agency guidance given in the current version of Ecology's *Permit Writer's Manual* (Publication Number 92-09) for a sequential batch reactor treatment facility.

Monitoring of sludge quantity and quality is necessary to determine the appropriate uses of the sludge. Biosolids monitoring is required by the current state and local solid waste management program and also by EPA under 40 CFR 503.

The proposed permit requires the Peshastin POTW to monitor for Flow, $BOD_{5,}$ TSS, pH, Temperature, Fecal Coliform Bacteria, Dissolved Oxygen, Total Ammonia, Total Hardness, and Total Phosphorus to further characterize the effluent. These pollutants could have a significant impact on the quality of the surface water. In addition to the above, the POTW is required to monitor, on a limited basis, Nitrite and Nitrate, Fats, Oil and grease, Total Dissolved Solids and Total Kjeldahl Nitrogen to support the next permit application.

LAB ACCREDITATION

Ecology requires that facilities must use a laboratory registered or accredited under the provisions of chapter 173-50 WAC, *Accreditation of Environmental Laboratories* to prepare all monitoring data (with the exception of certain parameters). Ecology accredited the laboratory at this facility for:

OTHER PERMIT CONDITIONS

REPORTING AND RECORD KEEPING

Ecology based permit condition S3. on its authority to specify any appropriate reporting and record keeping requirements to prevent and control waste discharges (WAC 173-220-210).

PREVENTION OF FACILITY OVERLOADING

Overloading of the treatment plant is a violation of the terms and conditions of the permit. To prevent this from occurring, RCW 90.48.110 and WAC 173-220-150 require to take the actions detailed in proposed permit requirement S4. to plan expansions or modifications before existing capacity is reached and to report and correct conditions that could result in new or increased discharges of pollutants. Condition S4. restricts the amount of flow.

OPERATION AND MAINTENANCE (O&M)

The proposed permit contains Condition S5. as authorized under RCW 90.48.110, WAC 173-220-150, chapter 173-230 WAC, and WAC 173-240-080. Ecology included it to ensure proper operation and regular maintenance of equipment, and to ensure that takes adequate safeguards so that it uses constructed facilities to their optimum potential in terms of pollutant capture and treatment.

PRETREATMENT

Duty to Enforce Discharge Prohibitions

This provision prohibits the publicly owned treatment works (POTW) from authorizing or permitting an industrial discharger to discharge certain types of waste into the sanitary sewer.

- The first section of the pretreatment requirements prohibits the POTW from accepting pollutants which causes “Pass-through” or “Interference”. This general prohibition is from 40 CFR §403.5(a). Appendix B of this fact sheet defines these terms.

- The second section reinforces a number of specific State and Federal pretreatment prohibitions found in WAC 173-216-060 and 40 CFR §403.5(b). These reinforce that the POTW may not accept certain wastes, which:

    - Are prohibited due to dangerous waste rules.
    - Are explosive or flammable.
    - Have too high or low of a pH (too corrosive, acidic or basic).
    - May cause a blockage such as grease, sand, rocks, or viscous materials.
    - Are hot enough to cause a problem.
    - Are of sufficient strength or volume to interfere with treatment.
    - Contain too much petroleum-based oils, mineral oil, or cutting fluid.
    - Create noxious or toxic gases at any point.

40 CFR Part 403 contains the regulatory basis for these prohibitions , with the exception of the pH provisions which are based on WAC 173-216-060.

- The third section of pretreatment conditions reflects state prohibitions on the POTW accepting certain types of discharges unless the discharge has received prior written authorization from Ecology. These discharges include:

    - Cooling water in significant volumes.
    - Stormwater and other direct inflow sources.
    - Wastewaters significantly affecting system hydraulic loading, which do not require treatment.

Federal and State Pretreatment Program Requirements

Ecology administers the Pretreatment Program under the terms of the addendum to the "Memorandum of Understanding between Washington Department of Ecology and the United States Environmental Protection Agency, Region 10" (1986) and 40 CFR, part 403. Under this delegation of authority, Ecology issues wastewater discharge permits for significant industrial users (SIUs) discharging to POTWs which have not been delegated authority to issue wastewater discharge permits. Ecology must approve, condition, or deny new discharges or a significant increase in the discharge for existing significant industrial users (SIUs) (40 CFR 403.8 (f)(1)(i) and(iii)).

Industrial dischargers must obtain a permit from Ecology before discharging waste to the (WAC 173-216-110(5)). Industries discharging wastewater that is similar in character to domestic wastewater do not require a permit.

Routine Identification and Reporting of Industrial Users

The permit requires non-delegated POTWs to take "continuous, routine measures to identify all existing, new, and proposed significant industrial users (SIUs) and potential significant industrial users (PSIUs)" discharging to their sewer system. Examples of such routine measures include regular review of water and sewer billing records, business license and building permit applications, advertisements, and personal reconnaissance. System maintenance personnel should be trained on what to look for so they can identify and report new industrial dischargers in the course of performing their jobs. The POTW may not allow SIUs to discharge prior to receiving a permit, and must notify all industrial dischargers (significant or not) in writing of their responsibility to apply for a State Waste Discharge Permit. The POTW must send a copy of this notification to Ecology.

Support by Ecology for Developing Partial Pretreatment Program by POTW

Ecology will provide technical assistance to in fulfilling these joint obligations. In particular, it will assist with developing an adequate sewer use ordinance, notification procedures, enforcement guidelines, and developing local limits and inspection procedures.

SOLID WASTE CONTROL

To prevent water quality problems the facility is required in permit Condition S7 to store and handle all residual solids (grit, screenings, scum, sludge, and other solid waste) in accordance with the requirements of RCW 90.48.080 and state water quality standards.

The final use and disposal of sewage sludge from this facility is regulated by U.S. EPA under 40 CFR 503, and by Ecology under chapter 70.95J RCW, chapter 173-308 WAC "Biosolids Management," and chapter 173-350 WAC "Solid Waste Handling Standards." The disposal of other solid waste is under the jurisdiction of the Chelan County Health Department.

GENERAL CONDITIONS

Ecology bases the standardized General Conditions on state and federal law and regulations. They are included in all individual municipal NPDES permits issued by Ecology.

PERMIT ISSUANCE PROCEDURES

PERMIT MODIFICATIONS

Ecology may modify this permit to impose numerical limits, if necessary to comply with water quality standards for surface waters, with sediment quality standards, or with water quality standards for ground waters, based on new information from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

Ecology may also modify this permit to comply with new or amended state or federal regulations.

PROPOSED PERMIT ISSUANCE

This proposed permit meets all statutory requirements for Ecology to authorize a wastewater discharge. The permit includes limits and conditions to protect human health and aquatic life, and the beneficial uses of waters of the state of Washington. Ecology proposes to issue this permit for a term of 5 years.

REFERENCES FOR TEXT AND APPENDICES

Environmental Protection Agency (EPA)

1992. *National Toxics Rule.* Federal Register, V. 57, No. 246, Tuesday, December 22, 1992.

1991. *Technical Support Document for Water Quality-based Toxics Control*. EPA/505/2-90-001.

1988. *Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling.* USEPA Office of Water, Washington, D.C.

1985. *Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water*. EPA/600/6-85/002a.

1983. *Water Quality Standards Handbook.* USEPA Office of Water, Washington, D.C.

Tsivoglou, E.C., and J.R. Wallace.

1972. *Characterization of Stream Reaeration Capacity*. EPA-R3-72-012. (Cited in EPA 1985 op.cit.)

Washington State Department of Ecology.

2006. *Permit Writer's Manual.* Publication Number 92-109 (http://www.ecy.wa.gov/biblio/92109.html)

Laws and Regulations (http://www.ecy.wa.gov/laws-rules/index.html)

Permit and Wastewater Related Information (http://www.ecy.wa.gov/programs/wq/wastewater/index.html)

Water Pollution Control Federation.

1976. *Chlorination of Wastewater*.

Wright, R.M., and A.J. McDonnell.

1979. *In-stream Deoxygenation Rate Prediction.* Journal Environmental Engineering Division, ASCE. 105(EE2). (Cited in EPA 1985 op.cit.)

APPENDIX A--PUBLIC INVOLVEMENT INFORMATION

Ecology proposes tore issue a permit to Peshastin POTW. The permit includes wastewater discharge limits and other conditions. This fact sheet describes the facility and Ecology's reasons for requiring permit conditions.

Ecology will place a Public Notice of Draft on January 20, 2010 in the Cashmere Valley Record and the Leavenworth Echo to inform the public and to invite comment on the proposed draft National Pollutant Discharge Elimination System permit and fact sheet.

The notice –

- Tells where copies of the draft permit and fact sheet are available for public evaluation (a local public library, the closest regional or field office, posted on our website).
- Offers to provide the documents in an alternate format to accommodate special needs.
- Asks people to tell us how well the proposed permit would protect the receiving water.
- Invites people to suggest fairer conditions, limits, and requirements for the permit.
- Invites comments on Ecology's determination of compliance with antidegradation rules.
- Urges people to submit their comments, in writing, before the end of the comment period.
- Tells how to request a public hearing about the proposed NPDES permit.
- Explains the next step(s) in the permitting process.

NOTICE: **ANNOUNCEMENT OF AVAILABILITY OF DRAFT PERMIT**
PERMIT NO.: **WA-005217-5**
APPLICANT: **CHELAN COUNTY PUD #1**
PESHASTIN POTW
PO BOX 1231
WENATCHEE, WA 98807

has applied for renewal of National Pollutant Discharge Elimination System (NPDES) Permit No. WA-005217-5 in accordance with the provisions of Chapter 90.48 Revised Code of Washington (RCW), Chapter 173-220 Washington Administrative Code (WAC), and the Federal Clean Water Act.

Following evaluation of the application and other available information, a draft permit has been developed which would allow the discharge of municipal wastewater to a monthly maximum of 110, 000 gallons per day to the Wenatchee River at River Mile 20.7 from its facility located at 10395 Mill Road in Peshastin. All discharges to be in compliance with the Department of Ecology's Water Quality Standards for a permit to be issued.

A tentative determination has been made to reissue this permit based on the effluent limitations and special permit conditions that will prevent and control pollution. A final determination will not be made until all timely comments received in response to this notice have been evaluated.

PUBLIC COMMENT AND INFORMATION

The draft permit and fact sheet may be viewed at the Department of Ecology (Department) website: http://www.ecy.wa.gov/programs/wq/permits/central_permits.html. The application, fact sheet, proposed permit, and other related documents are also available at the Department's Central Regional Office for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m., weekdays. To obtain a copy or to arrange to view copies at the Central Regional Office, please call Cindy Huwe at 509/457-7105, e-mail cynthia.huwe@ecy.wa.gov, or write to the address below.

Interested persons are invited to submit written comments regarding the proposed permit. All comments must be submitted by February 20, 2010 (within 30 days of the final date of publication of this notice) to be considered for the final determination. Comments should be sent to: Department of Ecology, Central Regional Office, 15 West Yakima Avenue, Suite 200, Yakima, WA 98902, Attention: Cindy Huwe. E-mail comments should be sent to Cindy Huwe at cynthia.huwe@ecy.wa.gov.

Any interested party may request a public hearing on the proposed permit within 30 days of the publication date of this notice. The request for a hearing shall state the interest of the party and the reasons why a hearing is necessary. The request should be sent to the above address. The Department will hold a hearing if it determines that there is significant public interest. If a hearing is to be held, public notice will be published at least 30 days in advance of the hearing date. Any party responding to this notice with comments will be mailed a copy of a hearing public notice. Please bring this public notice to the attention of persons who you know would be interested in this matter. The Department is an equal opportunity agency. If you have a special accommodation needs, please contact Cindy Huwe at 509/457-7105 or TTY (for the speech and hearing impaired) at 1-800-833-6388.

Publication date of this Notice is January 20, 2010.

Ecology has published a document entitled *Frequently Asked Questions about Effective Public Commenting* which is available on our website at http://www.ecy.wa.gov/biblio/0307023.html. You may obtain further information from Ecology by telephone 509 457 7105, or by writing to the address listed below.

Water Quality Permit Coordinator
Department of Ecology
Central Regional Office
15 West Yakima Avenue, Suite 200
Yakima, WA 98902

The primary author of this permit and fact sheet is Richard Marcley**.**

APPENDIX B--GLOSSARY

1-DMax or **1-day maximum temperature -** The highest water temperature reached on any given day. This measure can be obtained using calibrated maximum/minimum thermometers or continuous monitoring probes having sampling intervals of thirty minutes or less.

7-DADMax or **7-day average of the daily maximum temperatures -** The arithmetic average of seven consecutive measures of daily maximum temperatures. The 7-DADMax for any individual day is calculated by averaging that day's daily maximum temperature with the daily maximum temperatures of the three days prior and the three days after that date.

Acute Toxicity—The lethal effect of a compound on an organism that occurs in a short period of time, usually 48 to 96 hours.

AKART – The acronym for "all known, available, and reasonable methods of prevention, control and treatment." AKART is a technology-based approach to limiting pollutants from wastewater discharges which requires an engineering judgment and an economic judgment. AKART must be applied to all wastes and contaminants prior to entry into waters of the state in accordance with RCW 90.48.010 and 520, WAC 173-200-030(2)(c)(ii), and WAC 173-216-110(1)(a).

Ambient Water Quality—The existing environmental condition of the water in a receiving water body.

Ammonia—Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

Annual Average Design Flow (AADF)—The average of the daily flow volumes anticipated to occur over a calendar year.

Average Monthly Discharge Limit—The average of the measured values obtained over a calendar month's time.

Best Management Practices (BMPs)—Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the state. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD_5—Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD_5 is used in modeling to measure the reduction of dissolved oxygen in receiving waters after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass—The intentional diversion of waste streams from any portion of a treatment facility.

Chlorine—Chlorine is used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

Chronic Toxicity—The effect of a compound on an organism over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

Clean Water Act (CWA)—The Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

Compliance Inspection - Without Sampling—A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

Compliance Inspection - With Sampling—A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations. In addition it includes as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the 85 percent removal requirement. Ecology may conduct additional sampling.

Composite Sample—A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing discrete samples. May be "time-composite" (collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots).

Construction Activity—Clearing, grading, excavation, and any other activity which disturbs the surface of the land. Such activities may include road building; construction of residential houses, office buildings, or industrial buildings; and demolition activity.

Continuous Monitoring—Uninterrupted, unless otherwise noted in the permit.

Critical Condition—The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

Dilution Factor (DF)—A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the percent effluent fraction, for example, a dilution factor of 10 means the effluent comprises 10% by volume and the receiving water 90%.

Engineering Report—A document which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report must contain the appropriate information required in WAC 173-240-060 or 173-240-130.

Fecal Coliform Bacteria—Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

Grab Sample—A single sample or measurement taken at a specific time or over as short a period of time as is feasible.

Industrial Wastewater—Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business; from the development of any natural resource; or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

Major Facility—A facility discharging to surface water with an EPA rating score of > 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Maximum Daily Discharge Limit—The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

Maximum Day Design Flow (MDDF)—The largest volume of flow anticipated to occur during a one-day period, expressed as a daily average.

Maximum Month Design Flow (MMDF)— The largest volume of flow anticipated to occur during a continuous 30-day period, expressed as a daily average.

Maximum Week Design Flow (MWDF)— The largest volume of flow anticipated to occur during a continuous 7-day period, expressed as a daily average.

Method Detection Level (MDL)—The minimum concentration of a substance that can be measured and reported with 99 percent confidence that the pollutant concentration is above zero and is determined from analysis of a sample in a given matrix containing the pollutant.

Minor Facility—A facility discharging to surface water with an EPA rating score of < 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Mixing Zone—An area that surrounds an effluent discharge within which water quality criteria may be exceeded. The area of the authorized mixing zone is specified in a facility's permit and follows procedures outlined in state regulations (chapter 173-201A WAC).

National Pollutant Discharge Elimination System (NPDES)—The NPDES (Section 402 of the Clean Water Act) is the federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the state of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State permit writers are joint NPDES/State permits issued under both state and federal laws.

pH—The pH of a liquid measures its acidity or alkalinity. It is the negative logarithm of the hydrogen ion concentration. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

Peak Hour Design Flow (PHDF)—The largest volume of flow anticipated to occur during a one-hour period, expressed as a daily or hourly average.

Peak Instantaneous Design Flow (PIDF)—The maximum anticipated instantaneous flow.

Quantitation Level (QL)— The smallest detectable concentration of analyte greater than the Method Detection Limit (MDL) where the accuracy (precision &bias) achieves the objectives of the intended purpose.

Reasonable Potential — A reasonable potential to cause a water quality violation, or loss of sensitive and/or important habitat.

Responsible Corporate Officer—A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or have gross annual sales or expenditures exceeding $25 million (in second quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures (40 CFR 122.22).

Technology-based Effluent Limit—A permit limit that is based on the ability of a treatment method to reduce the pollutant.

Total Suspended Solids (TSS)—Total suspended solids is the particulate material in an effluent. Large quantities of TSS discharged to receiving waters may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

Solid waste -- All putrescible and non-putrescible solid and semisolid wastes including, but not limited to, garbage, rubbish, ashes, industrial wastes, swill, sewage sludge, demolition and construction wastes, abandoned vehicles or parts thereof, contaminated soils and contaminated dredged material, and recyclable materials.

State Waters—Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

Stormwater—That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

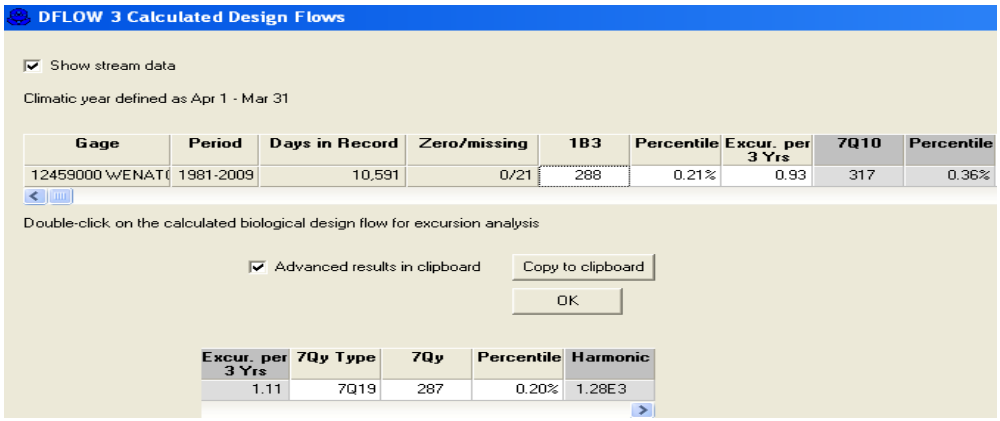
Upset—An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limits because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

Water Quality-based Effluent Limit—A limit on the concentration of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into receiving waters.

APPENDIX C--TECHNICAL CALCULATIONS

Several of the Excel® spreadsheet tools used to evaluate a discharger's ability to meet Washington State water quality standards can be found on Ecology's homepage at http://www.ecy.wa.gov/programs/eap/pwspread/pwspread.html.

7Q10 Analysis Wenatchee River at Peshastin 1981 to 2009



Mass Balance Dilution Factor Equations: Assumes Complete Mixing

Acute Dilution Factor

$$\frac{\text{2.5\% of 7Q10 (317 CFS) + Max Day (0.143 CFS)}}{\text{Max Day (0.143 CFS)}} \qquad \frac{7.93 + 0.143}{0.143} = 56 : 1$$

Chronic Dilution Factor

$$\frac{\text{25\% of 7Q10 (317 CFS) + Five year Max Avg Monthly Flow (0.096CFS)}}{\text{Five Year Max Avg Monthly Flow (0.096 CFS)}} \qquad \frac{79.3 + 0.096}{0.096} = 827 : 1$$

Spread of a plume from a point source in a river with boundary effects from the shoreline
based on the method of Fischer *et al.* (1979) with correction for the effective origin of effluent.

Revised 22-Feb-96

INPUT	Chronic (Max Avg.Month)	Acute (Max Day)
1. Effluent Discharge Rate (cfs):	0.096	0.143
2. Receiving Water Characteristics Downstream From Waste Input		
Stream Depth (ft):	0.78	0.78
Stream Velocity (fps):	2.20	2.20
Channel Width (ft): chronic 25% of channel width and acute 2.5% of channel width	185.00	185.00
Stream Slope (ft/ft) or Manning roughness "n":	0.035	0.035
0 if slope or 1 if Manning "n" in previous cell:	1	1
3. Discharge Distance From Nearest Shoreline (ft):	6	6
4. Location of Point of Interest to Estimate Dilution		
Distance Downstream to Point of Interest (ft):	300	30
Distance From Nearest Shoreline (ft):	6	6
5. Transverse Mixing Coefficient Constant (usually 0.6):	0.6	0.6
6. Original Fischer Method (enter 0) or *Effective Origin* Modification (enter 1)	0	0

OUTPUT		
1. Source Conservative Mass Input Rate		
Concentration of Conservative Substance (%):	100.00	100.00
Source Conservative Mass Input Rate (cfs*%):	9.60	14.30
2. Shear Velocity		
Shear Velocity based on slope (ft/sec):	#N/A	#N/A
Shear Velocity based on Manning "n":		
using Prasuhn equations 8-26 and 8-54 assuming		
hydraulic radius equals depth for wide channel		
Darcy-Weisbach friction factor "f":	0.154	0.154
Shear Velocity from Darcy-Weisbach "f" (ft/sec):	0.306	0.306
Selected Shear Velocity for next step (ft/sec):	0.306	0.306
3. Transverse Mixing Coefficient (ft2/sec):	0.143	0.143
4. Plume Characteristics Accounting for Shoreline Effect (Fischer *et al.* , 1979)		
Co	3.02E-02	4.50E-02
x'	5.70E-04	5.70E-05
y'o	3.24E-02	3.24E-02
y' at point of interest	3.24E-02	3.24E-02
Solution using superposition equation (Fischer eqn 5.9)		
Term for n= -2	0.00E+00	0.00E+00
Term for n= -1	0.00E+00	0.00E+00
Term for n= 0	1.16E+00	1.00E+00
Term for n= 1	0.00E+00	0.00E+00
Term for n= 2	0.00E+00	0.00E+00
Upstream Distance from Outfall to *Effective Origin* of Effluent Source (ft)	#N/A	#N/A
Effective Distance Downstream from Effluent to Point of Interest (ft)	300.00	30.00
x' Adjusted for *Effective Origin*	5.70E-04	5.70E-05
C/Co (dimensionless)	1.37E+01	3.74E+01
Concentration at Point of Interest (Fischer Eqn 5.9)	4.14E-01	1.68E+00
Unbounded Plume Width at Point of Interest (ft)	24.984	7.901
Unbounded Plume half-width (ft)	12.492	3.950
Distance from near shore to discharge point (ft)	6.00	6.00
Distance from far shore to discharge point (ft)	179.00	179.00
Plume width bounded by shoreline (ft)	18.49	7.90
Approximate Downstream Distance to Complete Mix (ft):	197,118	197,118
Theoretical Dilution Factor at Complete Mix:	3,306.875	2,220.000
Calculated Flux-Average Dilution Factor Across Entire Plume Width:	330.541	94.806
Calculated Dilution Factor at Point of Interest:	241.685	59.411

Calculation of pH of a mixture of two flows. Based on the procedure in EPA's DESCON program (EPA, 1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington D.C.)

Based on Lotus File PHMIX2.WK1 Revised 19-Oct-93

INPUT				
1. DILUTION FACTOR AT CHRONIC MIXING ZONE BOUNDARY	242.00	242.00	242.00	242.00
1. UPSTREAM/BACKGROUND CHARACTERISTICS	Ambient at Max pH		Ambient at Min pH	
Temperature (deg C):	20.30	20.30	20.30	20.30
pH: MAX Based on the 95th percentile	8.60	8.60	6.70	6.70
Alkalinity (mg CaCO3/L):	28.00	28.00	28.00	28.00
	Effluent @ Max pH	Effluent @ Min pH	Effluent @ Max pH	Effluent @ Min pH
2. EFFLUENT CHARACTERISTICS				
Temperature (deg C): Maximum report temperature	25.00	25.00	25.00	25.00
pH:	9.00	6.70	9.00	6.70
Alkalinity (mg CaCO3/L): Average	208.00	208.00	208.00	208.00

OUTPUT				
1. IONIZATION CONSTANTS				
Upstream/Background pKa:	6.38	6.38	6.38	6.38
Effluent pKa:	6.35	6.35	6.35	6.35
2. IONIZATION FRACTIONS				
Upstream/Background Ionization Fraction:	0.99	0.99	0.68	0.68
Effluent Ionization Fraction:	1.00	0.69	1.00	0.69
3. TOTAL INORGANIC CARBON				
Upstream/Background Total Inorganic Carbon (mg CaCO3/L):	28.17	28.17	41.40	41.40
Effluent Total Inorganic Carbon (mg CaCO3/L):	208.47	300.91	208.47	300.91
4. CONDITIONS AT MIXING ZONE BOUNDARY				
Temperature (deg C):	20.32	20.32	20.32	20.32
Alkalinity (mg CaCO3/L):	28.74	28.74	28.74	28.74
Total Inorganic Carbon (mg CaCO3/L):	28.91	29.30	42.09	42.47
pKa:	6.38	6.38	6.38	6.38
pH at Mixing Zone Boundary:	8.61	8.10	6.71	6.70

Freshwater un-ionized ammonia criteria based on EPA Gold Book
(EPA 440/5-86-001).

Based on Lotus File NH3FRESH.WK1 Revised 19-Oct-93

INPUT

1. Temperature (deg C; 0<T<30):	20.3
2. pH (6.5<pH<9.0):	8.61
3. Total Ammonia (ug N/L):	11900.0
4. Acute TCAP (Salmonids present- 20; absent- 25):	20
5. Chronic TCAP (Salmonids present- 15; absent- 20):	15

OUTPUT

1. Intermediate Calculations:

Acute FT:	1.00
Chronic FT:	1.41
FPH:	1.00
RATIO:	16
pKa:	9.39
Fraction Of Total Ammonia Present As Un-ionized:	14.1932%

2. Sample Un-ionized Ammonia Concentration (ug/L as NH3-N): 1689.0

3. Un-ionized Ammonia Criteria:

Acute (1-hour) Un-ionized Ammonia Criterion (ug/L as NH3-N):	213.7
Chronic (4-day) Un-ionized Ammonia Criterion (ug/L as NH3-N):	29.1

4. Total Ammonia Criteria:

Acute Total Ammonia Criterion (ug/L as NH3-N):	1,506
Chronic Total Ammonia Criterion (ug/L as NH3-N):	205

REASONABLE POTENTIAL CALCULATIONS

This spreadsheet calculates the reasonable potential to exceed state water quality standards for a small number of samples. The procedure and calculations are done per the procedure in Technical Support Document for Water Quality-based Toxics Control, U.S. EPA, March, 1991 (EPA/505/2-90-001) on page 56. User input columns are shown with red headings. Corrected formulas in col G and H on 5/98 (GB)

Parameter	Metal Criteria Translator as decimal	Metal Criteria Translator as decimal	Ambient Conc (metals as dissolved)	State Water Quality Standard: Acute	State Water Quality Standard: Chronic	Max concentration at edge of...: Acute Mixing Zone	Max concentration at edge of...: Chronic Mixing Zone	LIMIT REQ'D?	Effluent percentile value		Max effluent conc. measured (metals as total recoverable)	Coeff Variation		# of samp	Multiplier	Acute Dil'n Factor	Chronic Dil'n Factor
Parameter	Acute	Chronic	ug/L	ug/L	ug/L	ug/L	ug/L			Pn	ug/L	CV	s	n			
AMMONIA Max Day	0.95	0.95	0.01	1506.00	205.00	191.13	46.60	NO	0.95	0.95	11900.00	0.60	0.55	59.00	1.00	59.00	242.00

DMR DATA

	ALKALINITY	BOD	BOD	BOD	BOD	COLIFORM,	COLIFORM,	FLOW	FLOW	FLOW	FLOW	HARDNESS,	AMMONIA	OXYGEN, DI	OXYGEN, DI	OXYGEN, DI	PH	PH	PHOSPHOR	TSS	TSS	TSS	TSS	Temp	Temp	Temp	Temp	Temp
	AVG	AVG	AVG	AVW	AVW	GEM	GMT	AVG	MAX	MIN	TOT	AVG	AVG	AVG	MAX	MIN	MAX	MIN	AVG	AVG	AVG	AVW	AVW	AVG	Critical	MAX	Critical	MIN
	MG/l	LBS/DAY	MG/l	LBS/DAY	MG/l	#/100 Ml	#/100 Ml	MGD	MGD	MGD	MGD	MG/l	MG/l	MG/l	MG/l	MG/l	S.U.	S.U.	MG/l	LBS/DAY	MG/l	LBS/DAY	MG/l	°C	°C	°C	°C	°C
EFFLUENT																												
1-Jan-05	193	2.4	4.6	3.7	7.2	3.6	9.3	0.047	0.065			178	1.01	1.49		1.05	7.25	7.07		3.6	3.1	9.3	5.2	11.0		12		
1-Feb-05	170	1	2.5	1.5	3.8	1	1	0.044	0.056	0.029	1.245	166	0.33	4	5.31	2.66	7.34	7	15	1.7	4.5	2.4	6	12.0		13		11
1 Mar 05	138	0.8	2.2	1	2.8	1	2	0.04	0.052	0.029	1.227	136	0.2	2.03	4.74	0.53	8.02	6.82	14.9	0.8	2.3	1.2	3.4	13.0		14		13
1-Apr-05	166	0.6	2	0.8	2.6	1	1	0.035	0.049	0.023	1.051	177	11.9	3.97	5.68	1.13	7.16	6.85	0.91	0.4	1.5	0.7	2.2	15.0		16		14
1-May-05	125	0.6	1.8	0.9	2.8	1	1	0.036	0.042	0.026	1.114	170	0.26	3.1	4.98	1.1	6.99	6.88	32.2	0.6	2	1.5	4.8	18.0		18		17
1-Jun-05	154	0.8	2.1	2.1	4.8	12	25	0.038	0.052	0.029	1.135	162	0.47	2.16	3.79	1.27	7.08	6.95	9.86	1.5	4	3.8	8.8	20.0	20	22	22	19
1-Jul-05	172	0.8	2	0.9	2.2	11	40	0.042	0.059	0.031	1.306	176	0.24	3.11	3.71	2.18	7.6	6.95	11.15	0.9	2.3	1.1	3	23.0	23	23	23	23
1 Aug 05	164	0.9	2.3	2	4.1	4	23	0.041	0.065	0.023	1.279	152	0.29	4.27	5.03	3.81	7.28	6.98	16.3	1.3	3.4	2.5	7.2	23.0	23	24	24	22
1-Sep-05	325	1.5	2.8	1.9	4	3	234	0.061	0.076	0.034	1.84	174	0.18	2.34	4.47	1.42	7.33	6.94	6.64	2.9	5	6.5	10.2	20.0	20	21	21	19
1-Oct-05	231	3.3	5.5	4	6.7	2	4	0.061	0.076	0.026	1.898	166	0.06	1.92	2.45	1.43	7.43	7.07	5.95	3.3	5.4	4.6	7.4	18.0		19		17
1-Nov-05	322	2.2	4	2.3	4.5	1	1	0.057	0.075	0.024	1.706	172	0.58	1.59	2	0.88	7.28	6.67	5.63	3.4	6.3	5.6	11.1	15.0		16		15
1-Dec-05	262	2.1	4.4	3.1	6.4	1	1	0.053	0.07	0.033	1.607	166	0.5	2.9	6.62	1.47	7.34	7.16	15	4.1	8.6	7.1	14.6	17.0		14		11
1 Jan 06	206	2.5	4.8	4	7.8	20	142	0.054	0.074	0.027	1.678	164	0.72	1.34	1.87	0.92	7.37	6.91	5.12	3.9	7.4	5.7	11	12.0		12		11
1-Feb-06	246	2.9	6	4.8	9.5	41	241	0.052	0.065	0.027	1.444	154	0.44	2.68	5.06	0.69	7.34	7.01	4.24	3.1	6.4	4.4	8.8	11.0		11		10
1-Mar-06	191	2.3	4.8	4.7	8.4	3	25	0.048	0.067	0.028	1.482	148	0.33	2.34	3.19	1.88	7.21	6.96	11.40	1.5	3.4	4	7.2	13.0		14		11
1-Apr-06	212	2.5	5.7	3.6	8	2	8	0.043	0.075	0.029	1.287	138	0.47	1.24	2.1	0.86	7.32	6.88	7.56	2.2	5.1	3.3	8.4	15.0		15		14
1-May-06	141	2.4	4.7	1.5	3.4	1	1	0.044	0.06	0.026	1.353	158	0.29	2.01	4.08	0.97	6.98	6.75	4.99	0.7	1.8	0.6	1.6	17.0		19		16
1 Jun 06	112	0.8	2.6	1.3	3.2	1	1	0.041	0.054	0.03	1.219	158	0.51	2.95	4.53	1.63	7.24	6.81	11.2	0.9	2.6	1.7	4	20.0	20	22	22	19
1-Jul-06	188	0.9	2.6	1.1	3.4	1	1	0.037	0.051	0.027	1.143	148	0.46	1.83	2.05	1.6	7.21	7	7.08	0.7	1.9	1.2	3.4	22.0	22	23	23	22
1-Aug-06	154	0.5	1.5	0.6	1.7	2	9	0.037	0.053	0.028	1.154	136	0.24	2	2.61	1.42	7.17	6.78	6.33	0.4	1.1	1.2	4	23.0	23	23	23	22
1-Sep-06	272	2	3.7	4.2	7.7	2	28	0.057	0.085	0.03	1.712	196	0.33	1.95	2.47	1.35	7.71	7.34	8.45	1.3	3.4	3.5	6.4	20.0	20	21	21	18
1-Oct-06	228	2.1	3.6	2.2	3.9	1	1	0.055	0.082	0.02	1.712	170	0.52	1.6	2.2	0.95	7.42	7.06	4.62	7.8	13.7	14	34.7	17.0		18		15
1 Nov 06	236	1.2	2.2	1.8	3.3	2	8	0.057	0.075	0.028	1.7	158	0.43	1.82	2.46	1.19	7.53	7.08	6.63	2.2	4.1	3.5	6.6	14.0		16		11
1-Dec-06	342	2	4.4	3.1	5.9	1	1	0.05	0.07	0.026	1.545	152	0.37	1.42	1.89	1.06	7.56	7.16	4.23	0.9	1.9	2.2	4.2	12.0		12		11
1-Jan-07	370	1.6	3.4	1.9	4.4	1	2	0.05	0.074	0.025	1.564	164	1.03	2.5	4.63	1.44	7.36	7.05	4.88	2.1	4.4	3.1	6.6	11.0		12		10
1-Feb-07	316	2.8	6.3	3.7	7.9	7	15	0.044	0.062	0.027	1.232	143	1.22	2.17	2.4	1.88	7.31	7.17	6.86	4.1	9.5	6.1	12.8	11.0		11		10
1-Mar-07	377	1.6	4.2	3.2	7.5	1	1	0.043	0.057	0.03	1.334	148	0.68	2.79	4.19	1.01	7.31	6.77	8.53	1.6	3.9	2.8	7.2	12.0		13		11
1-Apr-07	226	1	3.2	1.3	3.9	2	5	0.036	0.048	0.025	1.088	178	0.23	3.61	6.36	1.7	7.36	6.73	9.55	0.7	2.1	1	2.8	14.0		15		13
1-May-07	222	1	2.4	1.8	4	1	1	0.043	0.066	0.024	1.347	163	0.29	2.58	3.46	1.21	7.29	6.76	11.6	0.6	1.3	1.1	2.6	17.0		19		15
1-Jun-07	205	0.8	2.3	1	2.8	2	4	0.038	0.052	0.026	1.15	186	0.34	3.21	3.9	2.42	7.33	7.07	10.8	0.5	1.4	0.9	2	20.0	20	20	20	19
1 Jul 07	198	1	2.9	1.2	3.5	1	4	0.038	0.046	0.029	1.191	162	0.19	1.83	2.62	1.23	7.28	7.23	1.94	0.2	0.8	0.4	1.4	23.0	23	23	23	21
1-Aug-07	226	1.2	3.1	1.6	4.1	3	280	0.043	0.064	0.031	1.345	195	0.21	1.9	2.54	1.03	7.39	7.03	13.6	0.7	1.6	1.4	3.4	22.0	22	23	23	20
1-Sep-07	325	1.6	2.9	3.1	5.6	1	1	0.056	0.083	0.022	1.672	168	0.23	2.85	4.6	0.59	7.59	7.27	5.76	0.9	1.6	1.2	2.2	20.0	20	21	21	19
1-Oct-07	395	1.3	2.4	1.5	2.8	1	1	0.055	0.07	0.03	1.72	160	0.29	2.26	3.34	1.41	7.52	7.22	7.08	0.9	1.6	1.2	2.2	16.0		17		15
1-Nov-07	262	1.4	2.3	1.8	3	1	1	0.058	0.082	0.022	1.793	166	0.28	3.15	4.55	2.53	7.55	7.31	5.37	1.1	1.9	1.6	2.8	14.0		14		13
1 Dec 07	257	0.8	1.8	1.4	3.2	1	1	0.054	0.08	0.027	1.688	178	0.27	1.84	2.62	1.32	8.38	7.07	7.57	0.5	1.3	0.8	2	11.0		12		10
1-Jan-08	143	1.1	1.9	2.2	3.8	1	1	0.056	0.074	0.025	1.734	172	0.29	4.42	7.08	1.33	7.37	6.97	7.37	0.7	1.3	1.4	2.4	18.0		10		9
1-Feb-08	201	0.9	2.2	1.7	4.5	1	1	0.043	0.078	0.029	1.416	163	0.33	1.9	2.49	1.6	7.41	7.11	8.28	1.3	3.1	1.6	3.8	12.0		12		11
1-Mar-08	192	1.1	2.3	2.3	4	1	1	0.044	0.069	0.031	1.368	190	0.23	2.43	3.89	1.67	7.45	7	1.49	0.4	0.8	0.7	1.2	12.0		12		12
1-Apr-08	211	0.5	1.4	0.9	2.4	1	1	0.038	0.049	0.029	1.138	211	0.25	3.31	3.31	1.37	7.22	7.06	10.7	0.3	0.5	0.2	0.8	15.8		15.8		15
1 May 08	173	0.5	1.4	0.8	2.1	1	1	0.038	0.051	0.025	1.171	178	0.27	2.8	4.63	1.69	7.41	7.05	15.3	0.6	1	1.2	3.2	16.0		19		15
1-Jun-08	89	0.4	1.9	0.5	2.4	1	1	0.028	0.047	0.021	0.85	172	0.27	3.81	5.78	1.66	7.58	6.86	8.11	0.3	1.2	0.4	2.2	20.0	20	20	20	19
1-Jul-08	172	0.8	2.7	1.2	4.3	1	1	0.032	0.047	0.02	0.999	174	0.26	1.28	1.96	0.85	7.45	7.01	6.31	0.4	1.6	1	3.6	23.0	23	24	24	20
1-Aug-08	125	0.6	2.1	1	2.6	1	1	0.026	0.032	0.02	0.995	168	0.28	2.6	4.16	1.18	7.23	6.97	11.4	0.6	1.9	1	3.1	22.0	22	23	23	20
1-Sep-08	165	2.6	4.4	7.9	12.8	17	993	0.056	0.08	0.03	1.682	178	10.08	2.28	4.36	1.13	7.22	7.15	7.92	2.6	4.4	7.6	12.4	18.0	18	19	19	17
1 Oct 08	144	5.9	10.9	17.2	33.8	6	125	0.062	0.092	0.033	1.931	172	3.84	4.03	6.23	4.03	7.34	7.1	4.27	4.6	7.8	11.9	20.4	16.0		17		14
1-Nov-08	142	1.2	2	1.9	2.9	8	16	0.057	0.09	0.022	1.715	174	0.25	3.19	4.14	2.2	7.53	7.16	8.48	1.6	2.4	4	6	14.0		14		14
1-Dec-08	164	1.2	1.9	1.4	2.4	3	7	0.056	0.089	0.029	1.735	163	0.19	4.25	5.4	2.6	7.39	7.11	8.27	0.6	1.1	1.1	1.8	11.0		13		10
1-Jan-09	145	1.7	3.1	1.9	2.7	3	72	0.05	0.084	0.03	1.85	180	0.37	2.46	3.26	1.98	7.11	7.01	6.26	0.7	1.1	1.8	2.6	18.0		10		9
1-Feb-09	158	1.3	3.1	2.3	5.2	2	7	0.043	0.061	0.034	1.21	182	0.23	4.07	5.44	1.77	7.18	7.12	7.88	1.1	2.7	2.9	6.6	11.0		11		10
1-Mar-09	184	0.8	2.4	0.9	2.9	6	89	0.036	0.069	0.025	1.123	186	0.35	4.66	6.37	2.89	7.21	7.1	7.93	0.3	1.1	0.4	1.6	11.0		11		10
1-Apr-09	198	0.9	2.5	1.7	4.8	4	24	0.054	0.086	0.023	1.07	162	0.22	3.61	4.68	1.9	7.39	7.13	4.67	0.9	2.5	2.1	6	15.0		13		12
1-May-09	166	0.4	1.3	0.5	1.5	1	4	0.037	0.058	0.021	1.148	354	0.21	2.68	4.17	1.61	7.2	7.14	7.88	0.6	1.8	1.1	3.2	17.0		18		16
1 Jun 09	201	0.6	1.6	0.8	1.8	54	79	0.038	0.064	0.021	1.136	190	0.25	2.39	3.4	1.42	7.41	7.15	6.02	0.6	1.4	0.8	2.2	20.0	20	21	21	19
1-Jul-09	195	0.5	1.4	1	3.1	1	1	0.047	0.062	0.035	1.462	180	0.36	2.43	3.63	1.57	7.4	7.15	4.02	0.3	0.8	0.5	1.6	22.0	22	25	25	21
1-Aug-09	204	0.2	1	0.3	1.3	1	1	0.035	0.062	0.02	1.085	166	0.26	3.22	3.56	2.33	7.32	7.24	3.62	0.3	1.1	0.6	1.4	24.0	24	24	24	23
Avg	208.9	1.4	3.1	2.3	4.9	4.5	38.4	0.047	0.065	0.027	1.395	170.5	0.8	2.7	3.9	1.6			8.3	1.5	3.1	2.8	5.5	16.2	21.3	17.0	22.2	15.1
Max	395.0	5.9	10.9	17.2	33.8	54.0	593.0	0.062	0.092	0.035	1.931	354.0	11.9	4.7	7.1	4.0	9.0		32.2	7.8	13.7	14.0	24.7	24.0	24.0	25.0	25.0	23.0
Min	89.0	0.2	1.0	0.3	1.3	1.0	1.0	0.028	0.032	0.020	0.850	138.0	0.2	1.2	1.9	0.5		6.7	0.3	0.2	0.5	0.2	0.8	18.0	18.0	10.0	19.0	9.0
												95th	4.464											95th %tile	23.95		24.55	

	BOD	BOD	BOD	BOD	BOD	BOD	TSS	TSS	TSS	TSS	TSS	TSS
	AVG	AVG	MAX	MAX	MIN	MIN	AVG	AVG	MAX	MAX	MIN	MIN
	LBS/DAY	MG/L	LBS/DAY	MG/L	LBS/DAY	MG/L	LBS/DAY	MG/L	LBS/DAY	MG/L	LBS/DAY	MG/L
	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value
INFLUENT												
IN1												
1-Jan-05	112	232	145	281			36	74	53	109		
1-Feb-05	51	136	56	0.053	45	120	27	72	37	97	18	48
1-Mar-05	53	156	60	185	42	128	16	46	22	68	12	34
1-Apr-05	78	255	103	316	65	200	55	180	63	201	44	132
1-May-05	81	258	97	314	71	229	32	103	60	194	20	62
1-Jun-05	87	263	101	306	71	198	60	181	101	300	20	57
1-Jul-05	103	285	149	435	38	109	53	149	91	266	17	42
1-Aug-05	63	177	80	240	55	121	34	97	72	215	18	51
1-Sep-05	149	269	217	383	66	143	110	195	239	421	22	48
1-Oct-05	100	175	116	196	77	134	59	103	114	196	33	58
1-Nov-05	158	280	238	386	122	218	107	183	275	446	40	76
1-Dec-05	180	388	348	696	104	273	152	313	464	927	16	48
1-Jan-06	133	256	153	296	116	205	47	90	72	148	28	54
1-Feb-06	84	197	106	237	50	136	32	75	39	96	21	58
1-Mar-06	128	291	203	437	75	176	74	172	116	259	18	40
1-Apr-06	164	411	331	685	92	234	56	146	93	194	25	58
1-May-06	130	0.043	270	0.058	76	188	33	82	50	116	25	66
1-Jun-06	68	212	90	271	47	162	34	101	85	274	12	41
1-Jul-06	93	291	131	404	58	166	34	103	45	128	20	64
1-Aug-06	58	179	99	228	46	139	28	78	78	179	10	33
1-Sep-06	87	167	109	212	51	113	30	58	46	94	19	32
1-Oct-06	105	192	124	222	93	169	35	63	40	71	29	54
1-Nov-06	136	261	155	321	96	196	44	86	65	129	26	53
1-Dec-06	88	259	119	365	47	204	20	60	26	98	10	40
1-Jan-07	124	283	172	368	87	204	39	88	65	138	22	51
1-Feb-07	79	187	100	231	52	135	23	56	32	72	14	36
1-Mar-07	74	194	120	305	37	102	22	57	40	101	15	43
1-Apr-07	70	225	129	386	30	108	28	88	60	181	8	36
1-May-07	79	210	113	376	33	76	79	195	188	450	22	52
1-Jun-07	79	220	140	382	29	92	29	79	44	120	15	46
1-Jul-07	88	279	104	355	73	212	23	78	38	129	10	28
1-Aug-07	77	188	108	227	61	151	22	55	31	88	16	40
1-Sep-07	54	103	67	132	39	75	35	66	48	88	21	40
1-Oct-07	94	183	117	212	74	159	31	62	37	67	27	55
1-Nov-07	132	230	146	282	96	150	91	159	115	222	44	68
1-Dec-07	102	227	136	271	55	166	54	126	73	160	40	81
1-Jan-08	121	234	136	272	93	174	66	128	99	197	31	58
1-Feb-08	133	299	171	394	101	258	65	147	111	255	43	106
1-Mar-08	111	269	147	323	80	200	60	145	75	174	42	126
1-Apr-08	156	406	81	237	47	148	73	191	43	128	26	82
1-May-08	74	227	81	254	60	188	41	127	60	164	31	81
1-Jun-08	54	237	67	287	38	171	21	90	25	106	14	59
1-Jul-08	50	176	75	263	25	111	27	95	47	142	15	51
1-Aug-08	42	161	62	178	31	150	29	108	48	124	16	79
1-Sep-08	89	161	117	219	64	129	38	70	67	122	26	43
1-Oct-08	74	133	79	150	65	102	65	110	116	178	32	55
1-Nov-08	59	95	81	126	37	57	59	95	73	114	48	83
1-Dec-08	90	0.056	120	0.084	62	0.029	73	127	121	183	36	63
1-Jan-09	92	147	113	178	76	117	78	112	103	169	39	60
1-Feb-09	63	168	73	197	51	146	32	78	50	113	19	54
1-Mar-09	66	199	87	239	35	124	23	88	52	129	1.6	42
1-Apr-09	76	207	59	190	41	141	37	114	28	89	16	54
1-May-09	78	245	87	298	66	203	53	161	128	364	23	71
1-Jun-09	93	241	108	270	81	210	82	213	144	391	38	98
1-Jul-09	101	263	182	454	56	143	74	189	169	423	34	87
1-Aug-09	57	206	72	242	45	159	43	142	62	163	29	124
Avg	93.2	217.7	125.9	280.6	62.2	154.9	48.6	115.2	84.6	192.3	23.9	60.0
Max	180.0	411.0	348.0	696.0	122.0	273.0	152.0	313.0	464.0	927.0	48.0	132.0
Min	42.0	0.0	56.0	0.1	25.0	0.0	16.0	46.0	22.0	67.0	1.6	28.0

EAP DATA 2001 2008

date	ALK	FC	FLOW	NH3_N	NO2_NO3	OP_DIS	OXYGEN	PH	TEMP
10/10/2007	14	4	880	0.01	0.01	0.0031	10.31	7.33	11.4
11/14/2007	12	1	1260	0.01	0.016	0.003	12.24	7.54	5.4
12/12/2007		1	2190	0.01	0.065	0.003	12.75	7.2	2.9
1/9/2008	17		957						
2/19/2008		1	880	0.01	0.05	0.003	13.16	7.24	1.1
3/19/2008	17	1	1410	0.01	0.03	0.0031	12.72	7.6	3.6
4/16/2008		2	2150	0.01	0.052	0.003	12.4	7.48	4.7
5/7/2008	9.5	1	5130	0.01	0.092	0.003	11.8	7.4	6.1
6/4/2008		1	10300	0.01	0.071	0.0031	11.41	7.05	6.8
7/9/2008	14	3	5890	0.01	0.033	0.003	10.1	7.19	12
8/13/2008		3	1180	0.011	0.01	0.003	9.1	7.38	16.1
9/10/2008		2	637	0.01	0.01	0.003	9.6	7.48	13.9
10/9/2006		15	254	0.01	0.012	0.004	10.92	7.18	9
11/14/2006		1	2800	0.01	0.057	0.003	11.93	7.43	4.5
12/13/2006		1		0.01	0.058	0.0033	12.88	7.54	2
1/8/2007		1	1700	0.01	0.065	0.0037	13.36	6.86	1.2
2/5/2007		1	779	0.01	0.058	0.003	13.43	7.26	0.9
3/5/2007		3	974	0.01	0.027	0.003	12.75	7.32	2.9
4/9/2007		1	4150	0.01	0.064	0.0041	12.75	7.29	5
5/8/2007		12	4990	0.01	0.059	0.003	11.63	7.37	6.6
6/12/2007		1	5170	0.01	0.042	0.0031	11.63	7.46	7.6
7/9/2007		2	3990	0.01	0.018	0.0044	10.4	7.6	12.9
8/15/2007		11	667	0.01	0.013	0.003	9.27	7.46	16.5
9/11/2007		1	382	0.01	0.01	0.003	9.69	7.54	14
10/3/2005		5	514	0.01	0.01	0.003	10.41	7.64	10.4
11/7/2005		4	693	0.01	0.01	0.003	11.42	6.95	6.1
12/5/2005		2	559	0.01	0.045	0.0034	13.46	7.21	1
1/11/2006		1	2030	0.01	0.074	0.003	12.68	7.59	2.5
2/6/2006		1	1010	0.01	0.056	0.003	13.06	7.13	1.8
3/6/2006		1	686	0.01	0.05	0.003	12.88	7.28	2.7
4/10/2006		1	1780	0.01	0.046	0.0042	12.37	7.44	3.8
5/8/2006		3	4330	0.01	0.08	0.003	11.85	7.62	5.9
6/6/2006		4	9960	0.01	0.062	0.0033	11.75	7.57	6.6
7/17/2006		5	2060	0.01	0.023	0.003	9.79	8.11	13.4
8/14/2006		8	630	0.01	0.013	0.003	9.38	7.28	15.7
9/11/2006		6	368	0.01	0.013	0.003	9.58	7.32	13.8
10/4/2004		24	798	0.01	0.01	0.003	10.55	7.3	10.1
11/1/2004		10	1320	0.01	0.01	0.003	11.87	7.08	5.7
12/6/2004		3	1680	0.01	0.057	0.003	12.12	6.85	3.3
1/3/2005		3	1750	0.01	0.065	0.0067	13.16	6.87	2.3
2/7/2005		1	3320	0.01	0.07	0.0037	12.79	6.99	2.3
3/7/2005		1	1550	0.01	0.046	0.003	12.24	7.46	4.3
4/4/2005		1	1910	0.01	0.048	0.003	12.14	7.16	4.3
5/2/2005		1	4540	0.01	0.064	0.0037	11.53	7.11	7.1
6/6/2005		6	3020	0.01	0.029	0.003	10.91	7.06	9
7/11/2005		13	1280	0.01	0.012	0.003	9.69	8.59	13.9
8/1/2005		19	590	0.01	0.012	0.003	8.71	7.32	18.8
9/12/2005		4	367	0.01	0.01	0.003	9.79	7.26	13.5
10/7/2002	22	6	162	0.01	0.01	0.003	13.4	7.01	0.1
11/4/2002	15	1	471	0.01	0.028	0.0034	12.3	7.27	3.5
12/2/2002	15	1	565	0.01	0.047	0.003	12.9	6.83	2.7
1/6/2003	12	3	2430	0.01	0.063	0.003	12.5	7.22	3.5
2/3/2003	15	2	785	0.01	0.043	0.0033	12.8	6.89	2.6
3/3/2003	14	1	2060	0.01	0.045	0.003	12.5	7.06	5
4/7/2003	13	1	3640	0.01	0.055	0.003	12.08	6.95	6.7
5/5/2003	10	2	7360	0.01	0.052	0.0031	11.67	7.74	7.6
6/2/2003	10	1	2490	0.01	0.015	0.0035	10.15	7.74	14.2
7/7/2003	13	6	792	0.01	0.01	0.003	9.84	7.13	16.5
8/4/2003	23	9	425	0.01	0.01	0.003	9.64	7.47	15.7
9/8/2003			217	0.01	0.012	0.003	10.9	7.66	7.8
10/10/2001			884	0.01	0.023	0.003	11.31	7.43	6.7
11/14/2001			928	0.01	0.051	0.003	12.2	6.79	3.2
12/5/2001			4600	0.01	0.065	0.003	12.46	7.28	2.9
1/9/2002			813	0.01	0.05	0.003	13.13	7.14	1.5
2/6/2002			1310	0.01	0.051	0.003	12.82	8.39	2.6
3/6/2002			1300	0.01	0.021	0.0032	12.6	6.98	3.3
4/3/2002			3370	0.011	0.051	0.003	12.4	7.07	4.9
5/8/2002	9.38		8860	0.01	0.058	0.003	11.6	6.98	7
6/4/2002	8.7		5220	0.01	0.028	0.003	10.8	7.19	10.2
7/10/2002	12		1200	0.01	0.011	0.003	10.19	6.99	11.7
8/7/2002	15		493	0.01	0.014	0.003	9.3	6.88	14.3
9/11/2002		2	921	0.01	0.01	0.005	10.7	8.51	8.3
10/3/2000		1	661	0.01	0.01	0.005	11.7	8.38	4.5
11/7/2000		2	377	0.01	0.03	0.005	14.21	7.35	4
12/5/2000		1	377	0.01	0.026	0.005	13.23	7.91	0.3
1/16/2001		1	370	0.01	0.029	0.005	13.36	7.8	2.2
2/6/2001		1	311	0.01	0.018	0.005	12.62	8.23	4.8
3/6/2001		1	1040	0.01	0.04	0.005	12.32	7.99	4.9
4/3/2001		1	2360	0.01	0.063	0.005	11.1	7.7	9.3
5/8/2001		1	3030	0.01	0.053	0.005	10.9	7.84	8.8
6/5/2001		1	1680	0.01	0.015	0.005	9.35	8.18	17.3
7/10/2001		6	588	0.01	0.011	0.005	9.07	8.02	20.3
8/14/2001		3	430	0.01	0.011	0.005	9.2	8.17	17.4
10/6/2003	18	1	311	0.01	0.01	0.003	10.02	7.27	12.5
11/3/2003	11.5	3	1390	0.01	0.038	0.003	11.97	7.19	5
12/7/2003	12.3	2	1370	0.01	0.056	0.003	12.34	7.25	3.2
1/12/2004	15		695	0.01	0.051	0.003	13.26	6.46	1.2
2/9/2004	15	1	921	0.01	0.051	0.003	13.46	6.69	1.1
3/8/2004	17	1	1050	0.01	0.043	0.003	12.5	7.1	3.8
4/12/2004	12	1	4460	0.01	0.075	0.003	11.91	6.87	5.9
5/3/2004	11	5	6390	0.01	0.057	0.003	11.31	7.1	7.4
6/7/2004	9.7	5	4650	0.01	0.038	0.003	10.7	6.96	9
7/12/2004	12	6	1190	0.01	0.012	0.003	10.6	6.7	14.7
8/2/2004	14	23	877	0.01	0.013	0.003	8.46	6.9	18.3
9/13/2004	14	13	699	0.01	0.01	0.003	9.94	7.66	13
MAX	23	24	10300	0.011	0.092	0.0067	14.21	8.59	20.3
AVG	14	4	2042	0	0	0	12	7	7
MIN	8.7	1	162	0.01	0.01	0.003	8.46	6.46	0.1

Total Phosphorus Testing of SIU Influent

Testing Conducted by the Peshastin POTW

TOTAL PHOSPHORUS TESTING

By: Cascade Analytical

Date	Peshastin Treatment Plant				Bluebird		Hi-Up		Community
	Meter Read (weekly gal)	Influent P (mg/L)	Meter Read (weekly gal)	Effluent P (mg/L)	Meter Read (weekly gal)	Rinse Tank P (mg/L)	Meter Read (weekly gal)	Rinse Tank P (mg/L)	(influent-BB/HU
1/19/05				20.50					
2/17/05				15.00					
3/15/05				14.90					
4/28/05				11.90					
5/27/05				15.60					
6/21/05		3.89		9.86		3.59			0.30
7/1/05	379216	36.90	385600	17.30		66.00			-29.10
7/8/05	273256	30.90	272120	15.20		29.80			1.10
7/15/05	307080	5.68	301400	10.80		1.60			4.08
7/22/05	304616	3.89	310360	7.45		1.20			2.69
7/29/05	297040	21.70	301780	9.54	6700	38.50	3600	0.21	5.15
8/5/05	291984	26.30	294790	7.12	6800	7.63	2000	0.67	5.33
8/12/05	236608	5.94	235660	6.30	10800	6.88	200	0.73	NS
8/19/05	238912	17.20	228520	14.00	6900	45.50	12700	5.64	18.10
8/26/05	347432	NS	346120	18.30	44900	16.60	34600	0.70	12.70
9/2/05	385368	7.01	366110	9.00	82000	3.79	74100	0.98	
9/9/05	385856	6.25	383750	4.28	38200	3.44	66900	0.48	
9/16/05	441080	4.44	440590	4.80	83500	3.38	76100	1.52	
9/23/05	458296	22.00	462570	18.40	89500	39.70	86900	5.52	
9/30/05	439760	NS	444690	NS	140800	NS	49000	NS	
10/7/05	448360	9.12	447780	6.27	19200	16.80	19900	9.83	5.82
10/13/05	383176	7.15	388800	7.46	67500	3.98	66300	0.71	4.62
10/21/05	492520	4.16	491460	4.12	101800	5.15	76000	0.79	4.12
10/28/05	417088	4.68	423350	4.71	107800	3.05	55000	1.29	8.48
11/4/05	416376	5.07	420380	5.63	122600	2.46	54600	2.30	7.83
11/18/05	839168	20.50	840990	13.40	129100	19.40	118700	1.92	7.56
11/29/05	517344	39.40	522430	16.70	119000	42.40	44900	1.41	7.13
12/13/05	769192	13.60	777400	14.40	147000	29.50	100300	2.38	3.13
12/20/05									
12/27/05									
1/3/06									
1/10/06									
1/17/06									

APPENDIX D--RESPONSE TO COMMENTS

Public Utility District #1 of Chelan County Comments:

Re: COMMUNITY OF PESHASTIN DRAFT NPDES PERMIT REVIEW COMMENTS

Dear Ms. Huwe:

Thank you for the opportunity to review the Draft NPDES permit and fact sheet for our Peshastin wastewater facility. Our comments are summarized below:

Section S2-A – Monitoring Schedule
The Draft Permit requires the district calculate percent removal of BOD_5 and TSS in the final effluent. The treatment process begins in the collection system where a considerable amount of BOD_5 and TSS are removed in the septic tanks serving District customers. Since it is not practical or feasible to determine percent removal of over 120 septic tanks, the Peshastin facility has never been required to calculate percent removal in the past. For this reason, we request the requirement to calculate BOD_5 and TSS percent removals be removed from the final permit.

Ecology's Comments:

Ecology agrees with the Chelan PUD assessment and therefore the removal rate calculation requirement for BOD and TSS is deleted from the permit.

Public Utility District #1 of Chelan County Comments continued:

Fecal Coliform
Ecology revised the fecal coliform limits from technology based limitations to water quality based limitations. We found no analysis in the Permit or Fact Sheet whether the technology based limits would be met at the end of the mixing zone. Rather, the change appears to be based on the facility's ability to meet the water quality based limitations according to historic operational data.

The design criteria of the Peshastin UV disinfection system is summarized below.

Parameter	Criteria
effluent source	extended air activated sludge
flow rate	370 gpm
quantity of lamp banks for treatment	1
quantity of lamp banks for redundancy	1
total quantity of lamp banks	2
Effluent quality (average monthly)	200 cfu/100 ml

Historic flows have been well below the design criteria for the plant. For example, the design effluent discharge from the SBR biological treatment system is 370 gpm. In comparison, the facility currently discharges approximately 150 gpm. The reduced rate of flow through the UV system exposes microorganisms to over two times the UV dose required to achieve the design effluent quality of 200 cfu/100 ml.

The UV system utilizes two banks of low pressure UV lamps. One bank of lamps is required to disinfect the design flow to 200 cfu/100 ml. The second bank is provided for redundancy. We have found that when a bank of lamps is not energized, the lamp sleeves become fouled very quickly. To prevent this rapid fouling and need for labor-intensive cleaning, the system is operated with both banks of lamps simultaneously.

The design flow rate through the UV system is approximately 2.5 times greater than the current rate. Thus, at the current flow rate of 150 gpm, the UV system is providing a dose approximately 2.5 times greater than what is necessary to achieve the technology based fecal limitation. With both banks of lamps operating, the UV system is providing double the dose necessary to achieve the technology based fecal limitation. These two factors combined provide a UV dose approximately five times what is necessary to achieve the design technology based fecal limitation.

It is important to recognize that the Peshastin UV system provides this elevated dose because (1) the plant is currently hydraulically under loaded and (2) the redundant bank of lamps is operated under normal operating conditions. If the permit limit were revised to 100 cfu/100 ml, the UV disinfection system would no longer be capable of treating the design flow while meeting the reliability requirements for the UV disinfection system. By reducing the permit limits, Ecology would effectively be reducing the capacity of the Peshastin wastewater facility.

It is also important to understand that regardless of the permit limits, the District will continue to operate the UV system in the same manner it has in the past. We anticipate effluent fecal concentrations will be well below the water quality based limit the majority of the time. However, the frequency the plant is out of compliance with the limits proposed by Ecology would increase.

In summary, reducing the effluent fecal limits would effectively reduce the hydraulic capacity of the treatment plant and increase the frequency of noncompliance while providing no discernable environmental benefit or improvement in water quality. For these reasons, we request Ecology replace the proposed effluent fecal limitations with the original average monthly limitations of 200 cfu/100 ml.

Please contact me at (509) 661-4131 if you have any questions or require additional information.

Sincerely,

Ron Slabaugh, P.E.
Water Resources Manager

Ecology's Comments:

Ecology finds the Chelan PUD rationale reasonable. Based on a simple mass balance analysis using four times the highest ambient value, an effluent discharge containing a maximum value of 400 colonies per ml at the chronic dilution of 242:1 or the acute dilution of 59:1 will not exceed the weekly average limit of 200. The average monthly limit is predicted to be exceeded by 5 colonies based on an ambient fecal coliform load four times that observed. Therefore, Ecology will reestablish the former fecal coliform limits for the effluent discharge at an average monthly of 200 colonies per ml and a maximum monthly colonies per ml at 400.

Bacteriological Mass Balance Model Peshastin POTW to the Wenatchee River					
CHRONIC DILUTION 247 :1					
Dilution Calculator	Effluent colonies per ml	Dilution Calculator	(4 times) Ambient colonies per ml	Final conc	Dilution factor
40.6	400	10000	100	101	247
			95th %tile		
177	400	10000	100	105	57